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UNIDENTIFIED NUTRITIONAL FACTORS AND RESISTANCE TO STRESS*

Benjamin H. Ershoff, Ph.D.†

Available data indicate that in addition to the known nutrients substances are present in natural foodstuffs which are required in increased amounts during various conditions of stress. Such factors are apparently dispensable under normal conditions, or their requirements are so small that they may readily be met by amounts present in the diet or through the synthetic activity of the intestinal flora or the animals' own tissues. Certain drugs or other stressor agents may, however, increase requirements for these substances to such an extent that deficiencies occur, manifested by retarded growth or tissue pathology, and preventable by the administration in appropriate amounts of the missing nutrient. We should like to review at this time some of the data obtained in our laboratory indicating the existence of such factors.

In 1945 a series of investigations was initiated on the effects of thyroid feeding on rats maintained on two types of basal rations. In one the B vitamins were provided as synthetic factors; in the other they were administered in similar amounts but in the form of yeast. Immature rats were placed on these rations at weaning, and the various diets were fed ad libitum. In view of the increased requirements for thiamine, pyridoxine and pantothenic acid in the hyperthyroid rat[1, 2], these vitamins were administered in excessive amounts in order to assure an adequacy of these factors in the diet. Gain in body weight was significantly reduced on both rations. Both groups showed an increase in ventricular, adrenal and kidney weights. In both series ovaries remained immature both in weight and microscopic appearance. In one respect, however, the animals differed significantly on the two diets: rats fed the yeast-containing ration lived significantly longer than those fed the synthetic diet[3].

With the demonstration that yeast prolongs the length of survival of immature rats fed massive doses of thyroid, the question immediately arose as to what factor or factors in yeast is responsible for the protective effect. Experiments were undertaken to determine whether the protective effective of yeast may be due to its content of known nutrients. The basal ration employed contained vitamin-free test casein, sucrose, salt mixture and 0.5 per cent U.S.P. desiccated thyroid, in addition to the synthetic B vitamins, and 2-methyl-1,4-napthoquinone. In addition to the above, each rat received supplements of cottonseed oil and vitamins A, D and E three times weekly. The supplements to be tested were incorporated in the above diet in place of an equal amount of sucrose and the various rations were fed ad libitum. It was demonstrated that supplements of all the known vitamins (including vitamin B_{12}) were without significant effect on the length of survival, growth retardation or inhibition of gonadal development of immature rats fed massive doses of thyroid[4-8]. Increasing the salt or casein content of the diet was without significant effect[4]. Desiccated whole liver[4, 9, 10], dried penicillin mycelia[8] and aureomycin mash[8], however, were as effective as yeast in prolonging the length of survival of immature rats fed massive doses of thyroid. Other materials of plant and animal origin, however, had little if any effect[4, 10]. In addition to prolonging survival, desiccated whole liver completely counteracted the growth retardation[4, 9, 10] and inhibition of gonadal development[9] of immature rats fed massive doses of thyroid. Available data indicate that the protective factor is distinct from any of the known nutrients (including vitamin B_{12}) and is retained in the water-

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insoluble residue of liver[4-8, 11, 12]. These findings were subsequently confirmed by a number of other investigators[13-21]. Desiccated and defatted kidney, aureomycin mash and full fat soybean meal were also potent sources of a growth-promoting factor for the hyperthyroid rat[7]. Although liver was effective in prolonging survival and counteracting the growth retardation and gonadal inhibition of immature rats fed massive doses of thyroid, it did not counteract other manifestations of thyroid feeding such as increased oxygen consumption, increased kidney, adrenal and ventricular weight and a decrease in ventricular creatine concentration[4]. It would appear from the above findings that the growth retardation, gonadal inhibition and decreased length of survival of immature rats fed massive doses of thyroid were not primary effects of excessive thyroid hormone but rather manifestations of an induced nutritional deficiency. This is indicated by the fact that these effects were largely, if not completely, counteracted by a dietary factor, which, however, was without significant effect on the pharmacological properties of the drug.

HYPERTHYROID ANIMAL

The requirements of the hyperthyroid animal are increased for a number of nutrients other than the factor or factors indicated above. In addition to an increased requirement for thiamine, pyridoxine and pantothenic acid[1, 2], requirements are also increased for the fat-soluble vitamins[1, 22], folic acid[23], vitamin B_{12}[24-27], and certain minerals and amino acids as well. Unless specific precautions are taken to prevent it, the administration of massive doses of thyroactive substance will precipitate a multiple deficiency. Under these circumstances, gain in body weight may be stimulated by any one of the deficient nutrients. Optimum growth, however, will not occur unless all essential nutrients are present in adequate amounts. The response of the hyperthyroid animal, however, is conditioned not only by the dietary content of the various nutrients indicated above, but also by such factors as the amount and source of dietary carbohydrate, protein and fat. When immature rats are fed purified rations containing casein as the dietary protein and sucrose as the dietary carbohydrate, a marked retardation in growth and inhibition of gonadal development occur following the administration of massive doses of thyroactive substances. These effects can be completely counteracted by the administration of the water-insoluble residue of liver, but not of supplements of any of the known nutrients[4-6]. Crystalline vitamin B_{12} under these conditions has little if any effect[5, 6, 28, 29], although Betheil and Lardy[26] observed some increment in body weight with this supplement. On rations containing low fat soybean meal as the dietary protein, however, the retardation in growth caused by massive doses of thyroactive substances has been counteracted both in the rat and the chick by crystalline vitamin B_{12}[24, 25, 27]. Similar results have been reported by Lewis et al.[28] on rations containing corn meal as the principal source of protein. The latter workers felt that the carbohydrate rather than the protein component in corn meal or soybean meal was responsible for the observed effects, since the growth retardation of hyperthyroid rats fed a purified ration containing casein as the dietary protein and dextrin or cornstarch as the carbohydrate was also counteracted by vitamin B_{12}, although such did not occur on rations containing sucrose as the dietary carbohydrate[28]. In our laboratory, however, Vitamin B_{12} was without significant effect on the growth retardation of hyperthyroid rats fed a purified ration containing casein as the dietary protein and cornstarch as the dietary carbohydrate. Liver residue, on the other hand, completely counteracted the attendant retardation in growth.

FAT CONTENT OF DIET

The fat content of the diet is also of importance in conditioning the response to thyroid administration. Increasing the fat content of the diet was as effective as vitamin B_{12} in counteracting the growth retardation of hyperthyroid rats fed a diet containing low fat soybean meal[27]. Fat was also effective in promoting a weight increment in hyperthyroid rats fed

casein as the dietary protein and sucrose as the dietary carbohydrate but its effect was less marked than that obtained with defatted liver residue[27, 28]. It would appear from the above findings that the carbohydrate, protein and fat components of the diet (quite apart from their nutritional value as a source of calories and essential nutrients) may significantly affect an animal's response to thyroid feeding. Further work is indicated to determine to what extent changes in the intestinal flora, induced by altering the carbohydrate, protein or fat component of a ration, may contribute to the above results.

In addition to protecting against the toxic effects of thyroid and other thyroactive substances, whole liver and more specifically its water-insoluble fraction were also found to be active in counteracting the toxic effects of massive doses of other drugs including promin[31, 32], atabrine[33, 34], cortisone acetate[35, 36], and acetylsalicylic acid[37]. Whole liver[38] and liver residue[39] were also active in prolonging the survival of rats administered multiple sublethal doses of x-irradiation. In each of the experiments indicated above, supplements of the known nutrients had little if any protective effect suggesting that the active factor in liver was distinct from any of the known nutritional factors. The term "antitoxic factor of liver" has been proposed to designate the factor (or factors) in liver responsible for the above effects. Findings indicate that fractions derived from liver residue which have antithyrotoxic activity are also active in counteracting the toxic effects of the other drugs indicated above as well as in prolonging the survival of rats administered multiple sublethal doses of x-irradiation. Further purification should provide the answer as to whether these effects are due to one and the same factor.

For a number of years it has been recognized that supplements of alfalfa and other succulent plants frequently exerted beneficial effects on the growth and reproductive performance of poultry, live stock and other species of animals. The literature in this field has been extensively reviewed by Kohler[40] and more recently by Slinger[41]. It is not clear, however, to what extent the results obtained were due to the presence of an unidentified nutrient (or nutrients) in these supplements or to what extent they were due to known nutritional factors in the test materials. Even if one could rule out a deficiency of known nutrients in the unsupplemented ration, one would still not be justified in concluding that the beneficial effects of alfalfa and the other supplements in the above experiments were unequivocally due to their content of one or more unidentified nutrients. Such factors as the effects of alfalfa or fracitons derived therefrom on the palatability of the test rations, on the type and amount of digestive enzymes secreted, on the rate of passage of ingested food through the intestinal tract, on the type of intestinal flora present in animals ingesting such supplements and the synthetic activity of such flora, these and related factors might all account for the beneficial effects of a test supplement on grounds other than the presence of an unidentified nutrient (or nutrients) in such material.

UNIDENTIFIED NUTRIENTS OF ALFALFA

In 1954 a series of experiments was initiated in our laboratory with the over-all objective of concentrating, isolating, identifying and eventually synthesizing the unidentified nutrients of alfalfa. As the first step in such a project it was necessary to develop practical and reliable bioassay procedures for the quantitative measurement of the potency of different batches of alfalfa and of fractions derived therefrom. In view of results obtained in studies of the "antitoxic factor of liver" in which requirements for this nutrient were augmented by exposing animals to various stressor agents, experiments were undertaken in an attempt to obtain experimental conditions in which requirements for an unidentified factor (or factors) in alfalfa could similarly be increased to the point where a deficiency of such a factor might become manifest. A number of drugs were studied for their capacity to produce growth retardation and other pathological effects in rats and mice fed highly purified rations complete in all known nutrients, which could be counteracted,

at least in part, by the addition of alfalfa and other succulent plants. It was observed that alfalfa meal contained an unidentified factor (or factors) distinct from any of the known nutrients that (a) counteracted the toxic effects of massive doses of glucoascorbic acid in the immature rat and mouse[42, 43] (b) counteracted the inhibitory effects of massive doses of estradiol on ovarian development in the immature rat[44] and (c) counteracted growth retardation and other toxic manifestations in immature rats and mice fed a low fat ration supplemented with massive doses of mineral oil[45]. In addition it was found that alfalfa and other succulent plants contained a factor (or factors) distinct from any of the known nutrients that significantly increased the growth of immature guinea pigs fed a mineralized dried milk ration[46], prolonged the survival of immature hamsters fed highly purified diets[47] and counteracted growth retardation, diarrhea and other toxic manifestations in immature rats and mice fed massive doses of Tween 60 and other non-ionic surface-active agents[48, 49]. Supplements of the known nutrients, either alone or in combination, had little if any protective effect under the conditions employed. Dried alfalfa juice, the waater-soluble extract of alfalfa, alfalfa ash or alfalfa lipids also had little if any activity. Alfalfa residue (the water-washed pulp remaining after extraction of the juice) was a potent source, however, of the active factor. It is suggested that the term "PR (Plant Residue) Factor" be employed as a generic term for the substance (or substances) in alfalfa residue (and other succulent plants) responsible for the effects indicated above. It is not known at the present state of concentration whether the "PR Factor" as defined above consists of one or a number of factors. Fractions derived from alfalfa residue which were active in counteracting symptoms of glucoascorbic acid toxicity however, were also active under the other conditions indicated above. Available data also indicate, that the "PR Factor" is distinct from the "anti-toxic factor of liver". This is indicated by the fact that liver residue has little if any protective effect under conditions where alfalfa residue is active; and conversely by the fact that alfalfa residue will not replace liver in counteracting the inhibition in body and ovarian weight of the immature hyperthyroid rat.

It is not unlikely that the "antitoxic factor of liver" and "PR Factor" may be of value not only in counteracting the toxic effects of the drugs indicated above but also the deleterious effects of intoxication from other causes. The mechanisms whereby these factors exert their protective effects are unknown. It appears that in some manner they enable the body to withstand the effects of a number of substances which, if present for prolonged periods of time in the organism, would otherwise be toxic; but the *modus operandi* remains obscure.

RELATIONSHIP TO SELYE'S IDEAS

One of the questions that immediately comes to mind is what relationship, if any, the factors indicated above have to the general adaptation syndrome described by Selye[50, 51]. According to Selye, every stress on the organism calls for some adaptation on the part of the organism. The first result of the stress is an alarm reaction, a call to arms by the body's defenses. Next follows the stage of resistance to the stress; and finally, the resistance may result in exhaustion, or death. Selye points out that "disease" consists of two components: damage and defense. Until recently the medical profession has been primarily interested in attacking the damaging agent (for example, killing the germ). Selye has pioneered in introducing the concept that improving the defense mechanism may neutralize the damaging agent and enable the organism to adjust to it. It would appear that the stage of exhaustion described by Selye in the general adaptation syndrome may be due, in some cases at least, to a conditioned deficiency of one or more of the nutrients indicated above. The available data certainly indicate that under some of the experimental conditions employed, the administration of the "antitoxic factor of liver" or the "plant residue factor" prevented the occurrence of what Selye termed a "state of exhaustion" and permitted the continuance of a "state of resistance". In view of the current interest in "diseases of adaptation" further in-

vestigations of the possible relationship of the "antitoxic factor of liver" and the "plant residue factor" on the course of the general adaptation syndrome would appear to be particularly warranted.

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NON-IDENTIFICATE FACTORES NUTRITIONAL E LE RESISTENTIA AL STRESS

Dr. phil. Benjamin H. Ershoff

SUMMARIO IN INTERLINGUA

Le datos que nos possede indica que—a parte le cognoscite nutrientes—il existe in le alimentos natural ancora substantias que es requirite in plus alte quantitates durante varie conditiones de stress. Sub conditiones normal, tal factores es apparentemente dispensabile, o le requirimentos de illos es si basse que illos es facilemente satisfacite per le quantitates presente in le dieta o producibile per le activitate synthetisante del flora intestinal o del tissus mesme del organismo. Tamen, certe drogas e agentes de altere formas de stress pote augmentar le requirimentos pro iste substantias usque a un si alte grado que deficientias se disveloppa, manifeste in retardo del crescentia o in un pathologia del tissu e prevenibile per le administration del appropriate quantitates del nutrientes in question. Nos propone revistar in iste communication certes del datos obtenite in nostre laboratorio in tanto que illos indica que factores del typo mentionate existe de facto.

Un del questiones que se subleva immediatemente concerne le possibile relation inter le factores in question e le syndrome del adaptation general que ha essite describite per Selye. Secundo Seyle, omne stress que affice le organismo evoca le un o le altere typo de adaptation del parte de ille organismo. Le prime resultato del stress es un reaction de alarma, un specie de appello mobilisatori del parte del fortias de defensa in le organismo. Seque alora le stadio del resistentia contra le stress. Finalmente, le resistentia pote resultar in exhaustion o morte. Selye signala que le "stato morbide" consiste de duo componentes: Injuria e defensa. Usque recentemente le profession medical se interessava primarimente in attaccar le agente injuriose (per occider, per exemplo, le germine). Selye ha le meritos de un pionero in le introduction del notion que meliorar le mechanismo de defensa pote servir a neutralisar le agente injuriose e a render le organismo capace a adjustar se con respecto a ille agente. Il parerea que le stadio del exhaustion describite per Selye in le syndrome del adaptation general es causate—al minus in certe casos—per le conditionate deficientia in un o plures del nutrientes supra-discutite.

NORTHEASTERN ASSOCIATION OF DENTAL EDITORS

The Northeastern Association of Dental Editors will hold their Fourth Annual Writing Conference on Friday, April 28, 1961 at the New York University College of Dentistry, 421 First Avenue, New York City.

This year's meeting on 'How to write a case report,' will explore the area of case reporting as a means of enriching the dental literature through the accurate presentation of clinical case material.

Dr. Paul Scheman, chairman of the writing conference announced that a practical and experienced panel of speakers has been obtained that promises to give weight and substance to the program. Dean Walter A. Wilson of Fairleigh Dickinson School of Dentistry, Austin Kutscher, Assistant Professor in the Division of Stomatology of Columbia University School of Dental and Oral Surgery, and J. A. Salzmann, former editor of the New York Journal of Dentistry, will be the main eassayists.

Dean Raymond J. Nagle, host to the conference will address the group. Dean Nagle's deep interest in the subject under discussion is well known, and he has made the excellent facilities of the college in their new building available to the meeting.

The annual writing conferences have been supported by a grant from the William J. Gies Foundation for the Advancement of Dentistry.

For further information on the conference please address inquiries to Dr. Paul Scheman, 134 West 58 Street, New York, 19, N. Y. Student registration fee is $1.00, and the fee for graduate practitioners is $3.00. Checks in these amounts may be sent to the chairman.

GERIATRIC QUESTIONS AND APPLICATIONS*

Joseph T. Freeman, M.D., F.A.C.P.†

It is axiomatic that there are no simple rules for obtaining and for sustaining a balance in health at any age. Increasing emphasis on the social and economic aspects of the elderly helps to outline their special medical contours. If one basic issue of biology is survival, then the cardinal principle of clinical medicine must be to aid in making this existence tenable.

Much is involved in the fact that there is a correlation between the length of life and the incidence of diseases. Although this is invariably true for aggregates, it is somewhat less true of any particular individual. Plans for preventive health with aging must be equalled by clinical considerations of long-living persons. These have been fortified by familiar figures for population expansion and the recognition of the fact that there are more pathologic manifestations of particular types in the aging. The ultimate is the patient facing a physician, personally concerned about the limitation of capacities, discomfort of diseases, and the hope for amelioration or cure. His diseases are the archetypes of recent demography.

As *pathogenesis* becomes apparent, is there any basis for differentiating diseases of older age?

In *classification,* do such concepts lead to particular clinical categories in aging?

By way of *identification,* do these categories require particular orientation in diagnosis?

In *management,* will the nature of medical care require particular training?

As the keynote to the situation, what are the individual and community results?

PATHOGENESIS: IS THERE ANY BASIS FOR DIFFERENTIATING DISEASES OF OLDER AGE?

Implicit in most disciplines of biology is the study of processes whose physiologic capacities constitute a particular set of standards. In this instance, senescence is the issue. Life spans in many shorter living species have been measured and their pathologic trends adapted to humans. Observations of aging in many organic forms have been made. All of this type of investigation necessarily leads to a deeper understanding of the mechanisms of the human species. Somatic considerations in humans, no matter their untoward form, are not to be diluted by ameliorating philosophic overtones. "Happiness", said Santayana, "is freedom from pain", and thereby every philosophical kite drags its tail in a biologic morass.

A considerable number of factors are involved in the life span of an individual by which future health and well-being are determined. Some are quite obvious like heredity which is more likely to find expression in a longer life cycle. Inherited and acquired capacities of immunoligic processes may explain certain diseases of older age. Congenital defects may do the same. A viral infection occurring in youth may be bandied by a variety of defensive forces, to be expressed ultimately in many forms, even as a neoplastic reaction.[1] A rheumatic aortic or mitral valve incurred in puberty may be a determinant of comfort in later life and of duration of survival. Hereditary and acquired modalities of tissue reactivity may be expressed in the ability to resist infection, to respond to types of stress, or to survive in difficult situations. The mechanisms of stress, operative as one of the forces of senescence, may impair certain organs and pace the progression of aging.[2] Accidents, type of nutrition, and extent of physical activities are parts of the equation identified as health, forms of diseases, and survival. Where a man works, how long, in what type of industry, self-induced or accidental forms of toxicity (such as exposure to tobacco, alcohol, lead, mercury, silica, or ionizing radiation) may be traced more or less directly to

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ultimate pathologic defects. An individual with Russian thistle allergy who lives east of the Mississippi River may never become aware of or undergo the discomfort of this trait until, by chance, he retires, for example, to an area where this particular pollen is common. A man working in a feather factory had his first attack of asthma at age thirty-seven after the arrival of a shipment of a certain variety of feathers from a particular type of poultry imported from China. Pulmonary tuberculosis in migrating Negroes, smallpox in American Indians exposed to European carriers, and measles in the Polynesian inhabitants of Pacific islands are familiar examples of direct associations. When, however, several etiologic factors become intermingled, the difficulty of indicating the cause of a disease in any stage of life, and more so at that latter stage which is the expression of decades of living, is more apparent. There are limitless vectors involved in the nature of the normal as well as the ill older personality.

Although the full impact of investigation must be directed against every disease process, fuller realization of capacity for health and survival will result from the determination of the principles in the progression of senescence.

The answer to the question, then, is that many influences in the pathogenesis of disease are joined to the nature of aging, which is a proper basis for the distinction of diseases in the older body.

CLASSIFICATION: DOES THIS RESULT IN PARTICULAR CLINICAL CATEGORIES IN THE AGING?

A corollary of these views of etiology is the fact that many forms of clinical significance characterize the older person. Certain diseases seem to be so common in older bodies as to make up a unique geriatric tabulation.

With older age there usually is a greater period of time-dimension between diseases and the conditions which could have triggered them. The result can be the product of agents which posed no urgent threat at inception, but initiated comprehensive measures by the body, which results were expressed later, possibly in atypical fashion. As a matter of fact, forms of expression can be entirely different, depending on the age of initiation, length of reaction, and properties of the host. Reimann has indicated a similarity to this situation in the subtlety of some ill-defined or changed responses to infection.[3] Others have pointed out such potentialities in conditions inclusive of, as well as other than, infections.[4] At any time in life, a latent, slowly-developing process can be transfigured into a lethal situation. It may, under certain situations, remain dormant. Certain therapeutic measures may release age-acquired restraints. Time and circumstances truly may alter "cases." It has been stated more formally: "An immediate antecedent biochemical event to death is not necessarily more valid in an explanation than is a remote social event"; and this can be appended to say, a remote inciting event. (Birren)

The identification of disease is based, first, on *symptoms* ("I hurt"); secondly, on *functional impairments* ("I'm not so good any more"); and, third, on *routine comprehensive surveys* ("It is a good thing to have a check-up occasionally"). In other words, the validity of symptom characteristics and the tabulation of metabolic qualities of the older body are primary to its precise diagnosis. But as symptoms become less well-defined, or diverted, or less well signalled by an aging mechanism, the value of the routine investigative study increases.

A barrier to comprehensive geriatric diagnosis is the gap between diseases present and active and the presence or degree of intensity of symptoms. There is an element of deception in this deadly game in which threats to life or well-being may not signal themselves in the aging organism in a way to which a physician is conditioned to respond with diagnostic or therapeutic measures. There are other restraints which deter him from proceeding with full investigations. Financial limitations, difficulties in transport, or even defeatism based on the "too old" theme, may seem to excuse lapses from comprehensive diagnosis. Every test deferred, every procedure altered because of age, simply

adds to the claim for specificity of age influences in clinical medicine. These restrictions tend to characterize individuals in late senility much more than they do the prime objectives of geriatric study, namely, those approximately age sixty and above.

A more subtle difficulty is the fact that much gerontologic data are derived from very old people and are then applied to those a full plateau lower in the age scheme. Assignment of observations on those in late senility to active, able individuals has confused the clinician and created a distaste for this branch of medicine.

Aside from the changing pattern of symptoms, there may be necessary adjustments in the evaluation of physical diagnostic signs according to change in size, shape, and content. No greater degree of older age somatic distinction can be had than that which is the common representation of the older body itself. For example, a sclerotic valve may be the result of many origins. An emphysematous lung may obscure cardiac or pulmonary changes. Structural realignments can change contours and initiate, imitate, or denigrate certain forms of disease presentations.[5] Associated with altered symptoms and a new code of signs, there are physiologic values of a variety of diminishing capacities, the knowledge of which belong in total assessment of the older patient.

The result is that certain diseases appear with remarkable regularity in tables of morbidity and mortality of older individuals. All of these facts confirm the basic feeling that the nature of aging produces geriatric categories for clinical consideration.

IDENTIFICATION: DO THESE CATEGORIES REQUIRE PARTICULAR ORIENTATION IN DIAGNOSIS:

Accepting the fact that all of the facets in longer living add up to diseases seen more commonly after age sixty, it is reasonable to assume that there must be different emphases in diagnostic methods. Part of this difference, as indicated, is based on the way in which the older body heralds its departure from normality. There is no rule that requires a classical disease to follow a classical design from a classical clinical description. The customary method of training students to make a diagnosis, and by professional or promotional methods to initiate automatic routines of treatment, break down if the facies of the disease or the capabilities of therapeutic responsiveness are changed. All of these are more likely to be the case in an older person.

In order to establish a diagnosis in geriatrics, it is useful to pay more attention to the details of family characteristics. These should include a careful survey of the nature of the diseases known to have occurred in the family, the length of the life of antecedents, the special medical characteristics, and as much such information as is liable to be obtained. Most older persons have a recollection of the health of their parents and of their parents' illnesses. It is a common statement that many patients expect to have the same condition as the mother or father, and to die at approximately the same year in life. Instead of such emphasis on family history, whose importance cannot be underestimated both for the individual and for gerontologic study, medical anamnestic shorthand has converted these critical data to a rather perfunctory accumulation of letters. No eugenist would be guilty of such genetic abbreviation.

In the personal history, the reviewer must be considered fortunate if he gets a typical syndromal pattern. Statistics would indicate that this will occur in a minority of instances, particularly if necropsy records are used as checks on diagnostic accuracy. The wonder is not that there are so many errors in omission and commission of diagnostic value in the old, but that there are, relatively speaking, so few. This point has been established in many studies.[6, 7, 8, 9]

If the history has been glossed over, and diagnostic error occurred, there is a tendency to resort to familiar face-saving comment based on the advanced age of the patient. The dictum holds that a minor symptom, accompanied by unusual manifestations, must initiate as much diagnostic fervor as extremes of pain, temperature, or jaundice. The silent gall stone, the symptomless diabetes, the apathetic thyroid

gland, the inactive pulmonary tuberculosis, the stealthy encroachment on a coronary artery lumen, a slowly progressive gastric fundal carcinoma, are only a few of the many deceivers. Add to these, thromboembolic situations, pyelonephritic kidneys slowly losing compensation, arteriosclerotic aneurisms, the slow halisteresis of bone integrity, pancreatic malignancy posing as a psychological disturbance, repeated small encroachments on viable cerebral cells, and the realization grows that these, and many more, can occur with few overt indications. The urgencies and complexities of full diagnosis in the elderly assume a respectful status.

Even if all the diseases could be eliminated, and assuming that the pathologist could adjust his criteria of tabulations, it would be impossible to downgrade the inherent characteristics of the aging process itself. The older body is not just a compound of diseases; it is an age-modified structure, with or without certain diseases, but always with evidence of progressive reductions in certain comparative capacities. No matter how many factors are traced in a pathologic situation, the well-known configuration of senescence itself remains. Somewhere along the line the disease and the physiologic reaction or impairment become joined. Old age can occur without disease just as disease can occur at any age. This is not the same as saying that old age is a disease; there is no syndrome of old age in a disease sense, although there is a pattern of senescence which is recognized universally. It is a state in which adjustments are made on an individual basis, and in which physiological equilibrium can be maintained uninterruptedly, with or without many definable diseases, but always with common the properties of aging of the species particularly, and as protoplasm generally.

Few diseases really can escape a comprehensive survey. Is there a danger in the current medical educational trends that there is more interest in the chase than in the kill? Are more emphases being put on methods of diagnosis regardless of the totality of benefits to be attained? Is there more interest in learning how to recognize and to "treat" than how to recognize and to manage? Reasonable as such questions are, they are to be asked by others than physicians. He can become impaled on concepts of senses of values. Where shall he draw a line in therapeutic efficiency? Does he have such privileges? Should he apply or withhold skills based on the patient's chronologic or physiologic age? Probably the best solution is to realize that physicians are not philosophers and must treat conditions as they present, without regard to patient status, whatever that may be. It is just as illogical to criticize the comprehensive treatment of pneumonia in a skid row pauper alcoholic with pulmonary tuberculosis in the winter as it is to curtail the treatment of cardiac decompensation of an older patient. By adherence to a routine of clinical direction, questions of youth and age or human values are left to those whose discipline fits them for such speculations. There is nothing in the training of a physician to prepare him for anything except the contest with a process which might cripple or terminate life, at any age. The object of geriatrics, as of every phase of medicine, is a full diagnosis to the limits of capabilities, and let the pathologic chips fall where they may. The fact that symptom intensity or distinction may deceive while the incidence of pathologic progression increases is simply another way of emphasizing the need for orientation in geriatric medicine. The full use of diagnostic ancillary aids, and the development of a battery of special clinical diagnostic methods based on a comprehensive knowledge of the older organism and older mechanisms are obligatory. It is essential, moreover, not only to identify diseases, but also to establish the degree of reduction in functional capacity which, not necessarily a disease, but a level of physiologic resource, can be compensated by proper effort.

In addition to the need for the identification of abnormal states in the older body, there is a need to explore the full scope of pathogenetic mechanisms which produce such diseases. This implies a full understanding of the mechanisms by which the senescent process is motivated. An action program of a medical nature for a

rapidly rising number of older individuals is based on such requirements. These are the strictures that require particular orientation in geriatric diagnosis.

MANAGEMENT: WILL SPECIAL TRAINING BE REQUIRED IN THE MEDICAL CARE OF THE AGING?

It is more than likely that instruction in special features of the older body can be incorporated in general medical education without the creation of extreme new didactic forms. This special information must be related by those who have attained a level of insight which gives their statements and work authority. The growing body of information has established the fact that, in geriatrics and gerontology, as in every other science, all conclusions of clinical importance must be expressed on scientific, and not empiric, grounds. Unsupported assumptions in gerontology involve too much hazard to warrant even passing acceptance. A review of increasing allocations in this type of research indicates the efforts to explore, rather than to exploit, the needs of the elderly. The problem can be settled by saying that there is no need for the creation of a specialty in geriatrics, but that there must be specially trained individuals to teach the subject.

In most younger age groups, with certain distinctive exceptions, many therapeutic measures can be undertaken with a single purpose. In geriatrics much more must be assumed in drug usage or the application of procedures. Collateral effects more readily induced, or physiologic imbalances more readily disturbed, or even reserves more readily depleted, require special therapeutic comprehension. The calculated risk is a phrase much more commonly used in medicine of older age than at any other stage of life. This is a natural qualification. Historically, in medical management there have been, and clinically there must be, calculations made for the changes commonly attendant on longer survival. These are of the very essence of special attributes in geriatric medicine.

ULTIMATE EFFECTS: WHAT ARE THE INDIVIDUAL COMMUNITY RESULTS?

Although artificial to a degree since they are interpretive rather than factual, there are four types of health resources in the elderly.

I. Health as it involves the single *individual.*

There are quite a number of illnesses, such as diabetes mellitus, coronary artery disease, dental defects, essential hypertension, pernicious anemia, and others, with which most individuals can cope without involving others, except, possibly, for medical advisors. Almost any type of illness can progress beyond a person's means and potentials. If illnesses become incapacitating, the individual can become a problem for the community or for his family. In a like way, almost any disease can be joined to the several resources of the individual, or extended to involve the resources of others.

II. Diseases which involve *community health.*

In any community a disease, such as pulmonary tuberculosis, syphilis, amebic dysentery, and others, which an individual has and which he might transmit to another, lessens his independence and makes him more liable to social regulation. This can become a matter of legal compulsion, family concern, or can be the result of lack of personal means by which to deal with debilitating long-term problems.

III. Illnesses that involve *community resources.*

There are many problems of health, such as stroke, amputations, blindness, mental illness, crippling neurological disorders, cancer, and others, which by their degree of incapacity, by their limitation on the ability to make a living, by the nature of the mechanics of a complex society, can require community effort. In aboriginal societies impaired individuals were more likely to be eliminated as the only sensible recourse. In more recent times such people were put out of sight in facilities of varying degrees of competence. The trend is toward special hospitals, research units, and trained teams, allied with economic and restorative health measures to salvage as much as possible and to make life as normal as can be. Most of the

health drives of current emphasis are included in this category.

IV. Matters of health involving the *community's environment.*

This is one of the major areas, consisting of occupational diseases, accidents, war, nutrition, heredity, political morality, public health measures, social integrity, and others, which is raising questions for each nation as it becomes more highly organized and integrated. In rural communities or countries which have yet to define national lines, there just has not been time or resources or capacities to spell out the rules of many situations. A man hunting meat in an African jungle who dies as the result of a tiger claw wound is not as likely to consider himself the victim of an occupational hazard as would a painter whose safety belt breaks while painting a New England church steeple. As more of the ecologic influences in health come under discussion and regulation, more effort must be directed into such channels, and the likelihood is greater that human beings will survive to their full biologic potential. It is not essential to aim for an enviroment in which just *survival* shall occur. This is already happening. Unfortunately, too often it has been associated with a greater incidence of senile ineptitude and dependence. Methods must be made by which to widen the gap in graphs showing more years lived and more diseases incurred. The social community will, and must, become an increasing asset to health and survival.

CONCLUSION

The conclusion to any discussion of medical and social situations in older individuals can lead to only one attitude, namely, that these questions require special identity as they merge with the body of general medical information. Illnesses which threaten the independence and the economic welfare of an older individual and his family are less likely to be managed adequately in the traditional ways of meeting these problems. There are too many forces which have diluted the simplicity of former times. For the occasional individual who has survived the many pitfalls of health and economics, either by choice or by chance, there will be whole populations equally or better equipped by cogent design. A tradition based on a pastoral community with its splendid dogma of independence and self-dependence is not applicable, not because of degradation in individual or community character, but because of changes in social forms. The evolution of medical thought and the depth of etiologic insight have created situations that old rules do not quite fit.

The biologic continuity between states categorically called diseases is in contrast with arbitrary tables of normality and is being made nebulous by social interference. In simple social surroundings, the biologic features of disease states are more apparent than in highly evolved and complex environments. Protective situations tend to obscure the basic features of disease and to make them seem to be deviations from the concept of "ideal" normality. In actuality the latter is a social creation once-again removed from its biologic basis. The acceptance of the fact of personal aging has become complicated by general therapeutic progress. This has been so marked and seems to be so limitless as to intrude an artificial note into the normal progression of senescent changes. This is not to deny therapeutic values nor hopes, but they must be viewed within human capabilities. The Florentine historian, Guicciardini, was said by Mary McCarthy to have reflected "that when he thought of the infinite vicissitudes to which human life are subject, he marveled to see an old man or good crop." He would have been more surprised to have seen consistently large numbers of individuals in healthy older age.

Medawar published a book under the title: *The Uniqueness of the Individual.*[10] It could be paraphrased to cover all of the explanations of the present situation as: *The Uniqueness of the Aging Individual.* With this particular identification there is greater likelihood that all aspects of older age ultimately will be merged with, rather than distinguished artificially from, the common patterns of living of any age level.

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PROBLEMAS E PRACTICAS DE GERIATRIA

per Dr. med. Joseph T. Freeman (F.A.C.P.)

SUMMARIO IN INTERLINGUA

Es un facto axiomatic que nulle simple regula governa le obtention e sustention de equilibrio de sanitate a non importa qual etate. Le crescente attention que es prestate al aspectos social e economic del problema del population de etate avantiate servi simultaneemente a delinear le aspecto medical de ille problema. Si le cardine in omne processos biologic es le objectivo del superviventia, il seque que le principio cardinal del medicina clinic debe esser le effortio de render le prolongate existentia possibile.

Le conclusion de omne discussion del stato medical e social de subjectos de etate avantiate debe esser que omne le detalios in le situation acquire un nove identitate quando illos es integrate con le corpore total del cognoscentias medical. Morbos que menacia le independentia e le benesser economic de subjectos de etate avantiate e de lor familias non se tracta prestemente de maniera adequate si le methodos traditional de tractar ille morbos es utilisate sin modification. Le dynamica nunc prevalente non es comparabile con le simplicitate de periodos passate. Si de tempore a tempore nos incontra un subjecto qui ha supervivite a un alte etate in despecto de omne hasardos de sanitate e de economia sin ulle adjuta externe, il ha certo vaste legiones de subjectos qui ha attingite le mesme stato como effecto de planos e de assistentia organisate. Le tradition del communitate pastoral, con su splendide dogma del independentia del individuo e de su autonomia, non es applicabile in nostre dies . . . non proque le individuo ha perdite su dignitate o proque le character de nostre communitates se ha degradate, sed simplemente a causa del transformation del formas social. Le evolution del pensar medical e le profundor de nostre comprension etiologic ha resultate in situationes que non es servite adequatemente per le regulas del passato.

PSYCHODYNAMICS AND BIOLOGIC STUDIES AS THEY CONCERN THE PROSTHODONTIST

C. H. MOSES, D.D.S., M.Sc.D.*

Not long ago a patient had been goaded by his wife into visiting my office for a removable partial denture. He had pitched his relatively new denture into the Rideau Canal in the City of Ottawa. He became, in the eyes of his wife, a completely antisocial creature as he defiantly appeared everywhere displaying a partially edentulous condition. The posterior teeth on the left side were the only upper teeth present.

All present will agree that this patient is not the type that is expected to be conducive to a successful patient-dentist relationship. The prosthodontist is frequently required to treat people on whom other dentists have pinned the tag "crazy" and I was certainly apprehensive about this patient. To complicate matters the patient volunteered that he was a gagger and that merely wearing a denture irritated him.

Gently, I recited to him the difficulty of the case and the need for cooperation. I assured him of the possibility of success and convinced him that he was not a gagger in the accepted sense. It turned out that he was not and the step by step procedure went along smoothly and without a hitch. The appliance was a complicated one with three internal precision attachments on the left side. The patient, however, mastered the difficult path of insertion without too much difficulty. This potential demon, with his immature behaviour pattern, proved to be a docile, friendly man behaving like a very normal person. He is an excellent patient.

Prosthodontists have frequently turned denture failures into success stories by simply doing accurate, careful work. There are numerous patients who appear difficult to cope with but who turn out to be very normal denture patients. The probable reason is that the band of tolerance which is usually a broad one with most people is very narrow with others. A considerable percentage of the latter may be helped with careful treatment and certainly should not be discouraged by a negative approach. That the band of tolerance is usually very broad may be witnessed by visiting some of the commercial dental laboratories and observing the many dentures constructed where standard dental procedures are completely disregarded. Inquiry will divulge that the majority of dentures are worn with a fair degree of comfort, and are, in the opinion of most patients, quite adequate.

On the other hand, some patients have appliances which are carefully and beautifully constructed but do not wear them. I confess that my blood pressure rises several notches when the patient begins to place four or five sets of teeth before me accompanied by a dramatic narration of some heartrending experience with each set of teeth. I admit I would like to be elsewhere than listening to this special performance. Some patients seem to treasure these dentures like antique dealers would a collector's item and about this time I am wondering if my dentures would be added to the other five, maybe mine will become Moses' the Sixth.

GOOD LISTENER

I've learned to become a good listener. I not only listen but I listen in a relaxed manner intended to make the patient feel that my time is fully dedicated to him and that I am very much interested in his problem. The patient is already seated when I arrive in the room with a cheerful, friendly "Hello." As I wash my hands I inquire whether the patient has a problem. Of course he has one or he would not be here, but I want him to hear the word "problem" mentioned to assure him that we are interested in solving it. I now seat myself in an

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ordinary chair, not the operating stool, which faces the patient to his right and listen as he unfolds his tale of woe.

FATHER-CHILD RELATIONSHIP

Psychiatrists and psychoanalysts are familiar with the therapeutic effect of permitting the patient to talk out his problems. Most denture problem patients want help from the dentist in the same manner as a child requests help from a parent. In fact, perhaps to a lesser degree, some of the success stories of difficult denture cases are such because a parent-child type of relationship has developed between the patient and dentist. It has often been said that this is frequently the case during psychoanalytical treatment, a father-child relationship develops between the physician and the patient.

I am this minute thinking of a female patient who adopted me as a father. In case the image of a sweet young thing appears in your mind's eye, this woman is a seventy-five year old spinster. When she moved to Toronto from New York City she was wearing well made, acceptable dentures but she also brought along other teeth in a lovely case especially adapted for that purpose. She had been having dentures made, complete and partial, which she said were unsatisfactory, for more than twenty years. Perhaps there was a menopausal complication which triggered off her teeth problem. We shall discuss this subject later. She reasoned that since she was going to be a permanent resident of Toronto it would be more than right that her new Toronto dentist start out by making her two complete sets of dentures, one being a spare.

This is not a common occurrence, and my olfactory organ began to sniff a rodent. I immediately suspected that she will prove to be a very troublesome patient. I therefore told her how much the dentures would cost and in what manner I wanted to be paid. Furthermore, if adjustments were necessary there would be a fee based upon an hourly rate after the first six visits. On top of this laboratory fees would be extra if they were needed. The patient met all my terms, the dentures were delivered and since then she has found every conceivable excuse to visit with me. She even insisted that new dentures be made after a year despite the fact that the old ones were quite satisfactory. She is an interesting conversationalist and our appointments are usually pleasant to both of us. Very often, when I tell her there is no adjustment to be made she volunteers that she is happy to hear this but she just wants to make certain. This, of course, results in frequent visits.

Now, I do not pretend to have a great deal of knowledge of psychology, psychiatry or psychoanalysis, but this patient's problem is a complex one. There is a reason why teeth are very prominent factors in many people's mental agitations. There are aspects of human behaviour which are strongly orientated about the mouth and associated structures. This is not surprising since it has long ago been pointed out by Freud and others that the oral cavity and teeth are symbolic representatives of sexual organs and therefore, are a prominent factor in the behaviour pattern of individuals.

PSYCHODYNAMICS

Psychodynamics is defined as "the systematized knowledge and theory of human behaviour and its motivations." Dentists have been very slow to recognize that the oral structures are focal points about which certain unusual patterns of behaviour revolve. It is doubtful whether any other profession is more involved with certain patterns of behaviour than is dentistry for the simple reason that dentistry is concerned with the mouth and with teeth.

Too often does the dentist assume responsibility for failure of work which is adequately performed when for some obsure reasons, which only a qualified psychiatrist or psychoanalyst can ferret out, the cause is some traumatic psychologic disturbance. It is becoming obvious that dentists must become more conversant with psychiatric subjects if only to recognize the fact that a problem exists which is not dental. This reminds me of the headline which appeared in a Chicago newspaper when I suggested this in a lecture at the Chicago Winter Clinic, several years ago. It read, "It's not Dental, it's Mental."

PSYCHIATRISTS AND PSYCHOANALYSTS

I do not for a minute suggest that dentists undertake to give psychiatric diagnosis or treatment. This should be left to the specialists who receive years of specialized training; but the dentist should learn for his own protection to recognize abnormal behaviour and direct these patients to proper authorities for care. The dentist should also, for his own protection, set up a fee schedule that takes care of such patients whether they are recognized as problems or not. Some patients literally move into your office. If they move in, they should at least pay rent.

Of course it is not easy to suggest to a patient that they see a psychiatrist and a blunt, direct statement to that effect should be avoided. But more and more people are learning to seek assistance from psychiatrists and psychoanalysts and illustrations could be given of the many ailments which are considered to be psychosomatic in origin. Physicians have told me that more than fifty percent of *all* sicknesses have a psychosomatic feature in their origin. This is a huge percentage but I am assured that the estimate is very conservative. The average person usually considers the psychiatrist to be a "crazy" doctor, only dealing with insanity. This makes it more difficult to refer patients to a specialist.

BEHAVIOUR PATTERNS

When the patient arrives at the dentist's office he arrives in a state of mind which may be the result of many factors. One of these may be an upset which occurred just prior to the appointment. He may just have received a ticket for speeding while coming to the office or perhaps he has been unable to park his car. Or there may be factors of long standing. He may be the victim of an unhappy married life or some other disturbance and this may or may not show on his face or in his conversation as he faces you. What I am trying to say is that the patient, when he arrives, is a finished result which a few dental visits can not easily alter.

Perhaps he is a psychotic type of patient, ascending in spirits one moment and descending another or perhaps he possesses one of these strange drives which forces him to center his attention on his teeth or the oral cavity. The latter condition may have a variety of origins and may result in a variety of patterns. Let me, in a superficial manner, touch on a few of these. I do not pretend to know the subjects well, I wish only to draw them to your attention as, over the years, they have been brought to my attention.

ORAL STAGE

From the earliest pleasurable sensation of sucking for food develop other satisfactions manifested in a variety of substitutions from sucking the thumb, excessive masturbation and other phenomena. With healthy and satisfactory relationship with the parents and environment, sublimations occur and with normal substitution the child progresses into a well balanced individual in the accepted sense. However, there are individuals who continue to remain mouth-centered far longer than when this stage of oral satisfaction should have ceased. Oral disturbances of these people may have repercussions in their behaviour pattern and personality problems in many of these people may resolve themselves into manifstations of oral diseases.

BRUXISM

In recent years, because of injury to teeth, periodontal structures and ridges, dentistry has begun to take note of the clenching and grinding of teeth by some people. This is a behaviour pattern which many individuals adopt when under tension.

We could theorize about this and seek an explanation by observing lower animals. When danger approaches animals often bare their teeth, getting ready for defence. Teeth are also used in offence. Man does not often bite but when angry he frequently clenches his teeth. Some even snarl, bearing their teeth like the lower animals do. Man also clenches his teeth when under strain. The terms "gnashes his teeth" or "grits his teeth" are quite significant.

I once heard my little granddaughter grind her teeth while she was asleep. She was three years of age at that time. Grandma used to attribute this condition to "worms." What

great problems could a three year old child have? It dawned on me that this little girl was upset because of the recent birth of a baby sister who was receiving much attention. She was no longer the sole center of attraction.

An acquaintance of mine usually appears to be reserved with a tranquil facial expression but at times I notice his masseter muscles bunch up intermittently from pressure. This is more noticeable when the subject of conversation centers about a topic which irritates him.

Some people either clench or grind at night only, while others do so during the day. Bruxism is far more prevalent than imagined and with a denture wearer can create a great deal of havoc to the ridges. Also, patients undergoing mouth rehabilitation are in danger of generating trauma which could produce disastrous results to the supporting tissues if the grinding or clenching persists after the work is completed.

DOODLING WITH THE TONGUE

There are few vacuums found in nature. People dislike just sitting still and placid, doing nothing. That is why the sentence of solitary confinement is so feared among convicts. Some persons doodle on paper, twiddle their thumbs or tap their toes or fingers while filling in the vacuum of idle time. Some smoke a lot more while idling and others, having perhaps some auxilliary compulsion, eat incessantly.

There are some who form unnatural habit patterns with their tongue against their teeth as orthodontists well know, while still others begin to play with their artificial dentures. Once started, habit patterns are difficult to eradicate and it is difficult to break the habit of those who lift their dentures or play with the bar of a removable partial denture.

MENOPAUSE

We have noticed that abnormal reactions frequently occur during or after the menopausal stage. As a rule glandular changes are accompanied by hormonal imbalances. The autonomic nervous system which is tied in with certain activity in the vasomotor and glandular elements of the body appears to create unusual conditions with these people, which fact is well known to medical as well as to lay persons, during this important phase in life.

Menopausal and post-menopausal manifestations are observed very frequently in a dental practice. One condition often seen is dryness of the mouth. The salivary and mucous glands are affected. Frequently, also, the patient will complain of the presence of an unusually salty taste, or of a sweet taste, or some other taste peculiarity described by the individual.

Oral manifestations of an unusual pattern often occur in single women who reach or have reached and passed the menopausal stage. There is a psychologic reaction when the last opportunity of the natural functions of reproduction has disappeared. We must not lose sight of the fact that each tooth is a symbol of a male organ and the patient may symbolically play out some situation involving teeth.

I have a patient in mind, single and about fifty years of age, who wandered from dentist to dentist with the complaint that she cannot find a place to rest her jaws. I know about her visits to other dentists because she had consulted me and every once in a while a new dentist would telephone me for advice. Study casts and careful examination had rvealed no great abnormality in her occlusion. She was in good centric relationship with no prematurities. She was wearing a lower removable partial denture which could be called acceptable. I recognized by her type of loquacity while she rambled on in many directions that here was a disturbed person who should be handled cautiously. I sent her to a periodontal friend of mine for consultation about her gingivae. He ground a lower lateral incisor very slightly before he also recognized potential trouble and terminated the appointment. This patient subsequently nearly drove us crazy, insisting that by touching the lateral her occlusion was *completely* out of kilter where it had only been a *little* bit before.

She compared herself to the old man with the large beard who was asked by a little boy how he slept. Did he put his beard over the

blanket or under the blanket? From that day on he could not sleep.

Burning of the roof of the palate as well as of the tongue is also a frequent menopausal or post-menopausal phenomenon and during that stage tissue tolerance to pressure appears to be very low.

SENILE ATROPHY

Senile atrophy may affect many tissues. The muscles and bones could diminsh in size creating denture problems. There is a senile type of gingival recession and even senile decay. Prosthodontists frequently notice a dryness of the mouth and mucosa due to an atrophy of salivary and mucous glands.

GAGGING

Gagging with dentures is nearly a hundred percent a phenomenon which is psychogenic in nature. We may safely assume that all dentists know enough not to overextend the palatal portions of dentures. It could well be that it was primarily a safety measure evolved to reject obnoxious foods. Ultimately, it became a symbol of protest or rejection of other uncomfortable situations. The wearing of artificial dentures is very distasteful to many people.

Hypnosis has been used very successfully in caring for the gagging patient. I am always afraid that by employing hypnosis the gagging reflex may be replaced by a disturbance more dangerous than gagging itself, ulcers, for example. It is my opinion that gagging should be treated psychiatrically. However, in some instances, by using a form of suggestion, I have achieved success. Ultimately a correct habit pattern of wearing dentures was developed by the patient. With one method, I look seriously at the patient, facing him squarely and tell him in a positive voice that no person can gag while holding his breath. The patient is told that when a gagging sensation is triggered off, he is to hold his breath and count slowly to five before he exhales. The gagging will disappear. This has worked rather well with me and is really a form of suggestion. Before I undertake to work on a gagging patient, I exact a promise that he will wear the teeth night and day without snatching the teeth out of his mouth, for one month. If he does that conscientiously, I assure him that success will be ours. Correct habit patterns will have taken over.

TENSION

Whenever gagging is discussed tension always come to mind. Many people gag when under tension. People under tension may manifest a variety of conditions associated with the mouth. We have already discussed one type which produces bruxism. Another condition frequently seen by the dentist is temporomandibular joint dysfunction. While occlusion may be a prominent factor in triggering off temporomandibular joint disorders, there is usually a background which is psychosomatic in origin. Some people are more prone to temporomandibular joint diseases than others because of psychogenic factors. In this I agree with Laszlo Schwartz. I do everything I can to correct visible occlusal irregularities and, also, on some occasions carry out Victor Sears procedures of pivoting when I think they will help.

Tension has been known to produce a type of gingivitis when teeth are present and there are certain types of inflammation of the mucosa which also have a psychosomatic background. The autonomic system which in turn controls the vasomotor nerves may be the responsible agents. With some individuals the slightest stress on the mucosa produces a redness under complete or removable partial dentures. While this condition may in some instances be due to organisms or excessive pressure, in others, due to a psychosomatic background, a very slight pressure may trigger off an inflammatory reaction.

SYMBOLIZATION

We have already spoken of the symbolic representation of true objects or ideas. Repressed ideas may manifest themselves in symbols not even remotely resembling the actual situation or object and are subconscious in origin.

Since the mouth and teeth are sex symbols and much of our behaviour pattern has sexual

connotations even from early childhood, it is not at all surprising that many abnormal patterns of behaviour are noticed by dentists. Regretfully, when the dentist becomes involved it may prove a costly experience both from the standpoint of the dentist's health, from an economic point of view and, objectively, the patient's welfare.

A patient was referred to me by a dentist friend and had an unusual complaint. Her denture felt too tight and on wearing it for any length of time a pain developed in the back of the neck. I immediately assured the dentist and patient that I was very good at producing loose upper dentures. I knew of no connection between the maxilla with the nerves at the back of the neck and put this phenomenon down to "occlusion," which is usually blamed for a variety of failures. My carefully fabricated denture produced exactly the same result as her previous dentist's. That day I enquired from a psychiatrist, who was a patient of mine, whether he had an explanation, and, without hesitation he explained that hers was a symbolic manifestation. She evidently detested wearing artificial teeth and wearing teeth "Gave her a pain in the neck." At once, the horrible thought occurred to me that I must have many patients who feel uncomfortable when seated!

The late Dr. Samuel Charles Miller once spoke about language which he called "Organ Language." He recited the following, " 'I don't want to swallow that stuff that this fellow is handing out.' He gets an oesophogeal spasm or the gastric hydrochloric acid will stop secreting or he will click his teeth or he will contract his orbicularis oris to keep the outside from getting inside."

My patient who pitched his partial denture into the Rideau Canal could have been rejecting his previous dentist as a poor father substitute, for all I know. I may have been a better one. Probably there were deeper symbolic connotations than my wild guess of which I know nothing about.

TISSUE TOLERANCE

There are a variety of reasons why the tissues of some patients react to pressure more severely than others. I have already mentioned one. The threshold of pain is very low with some people. Apart from psychologic reasons there also may be physical reasons. This could mean that some patients will require adjustments on their dentures out of all normal proportions. I usually explain this possibility before I begin to make the dentures and illustrate it in the following manner: A husky young man, tweny years of age, stands at the foot of a staircase. I hand him a bag of potatoes weighing one hundred pounds and ask him to carry it up the stairs. He may lift the bag to his shoulders and run up the stairs. However, that very same man when he reaches the age of ninety could scarcely lift the bag. Even without the bag he will walk up the stairs with difficulty. A combination of the two might kill him. Age and associated senile factors create low tissue tolerance to a variety of stresses.

Let us now say that this husky young man is sick with pneumonia, we take him out of bed and we place him at the bottom of the staircase and give him the same task. He acts like the man of ninety; he also walks up the stairway with difficulty; he also cannot lift the bag. Systemic factors are important in tissue tolerance. We could go on and demonstrate that avitaminosis and other nutritional disturbances as well as hormonal imbalances could also create low tissue tolerance. A patient may or may not manifest some of these two obviously and reasonably good dentures will not act kindly to the tissues. That is why the physical status of the patient must be surveyed from every angle and safeguards should be introduced when the patient is first interviewed just in case an abnormal number of adjustments are necessary because some factors beyond the dentist's control are not recognized during the first or second visit.

ESTHETICS AND THE PATIENT

One of the most costly experiences in my practice has been the result of the selection and arrangement of teeth. Even dentists among themselves would probably not agree about the proper teeth for a given individual with reference to shape, size, colour, staining and

arrangement. When the term "natural" is used, it has different connotations among dentists as well as among patients.

In recent years new systems of tooth form have been proposed to dentists which appeal to the esthetic sense. It must be remembered that the latter has been artificially developed throughout the ages. When one thinks of a curvacious beautiful feminine form, each individual thinker conjures up a different picture. Much of this thinking has psychologic aspects. Some individuals may have a fetish for full anatomical accentuation of the mammary glands and this will be their idea of a beautiful figure, while others may emphasize the gluteous maximus and their idea of a beautiful female may resemble the woman with a bustle. This type of thinking may be projected in the selection of teeth. One of the new systems of tooth form selection suggests that in human tooth form the rounded form of a lateral incisor implies soft feminine characteristics while a straight, angled, large central is virile and more suited for a rugged he-man.

This method probably works out well and pleases most people, while actually it is completely wrong if we are to use the word "natural." Let us say, for example, that both parents are classically perfect in accordance with our accepted concepts of teeth and figure. The mother has a curvaceous form like Venus de Milo while the father is tall and husky with a square chin like Lil' Abner. His teeth are square in form, hers are rounded and "feminine." By some unhappy interchange of the genes the curvaceous teeth of the mother goes to the son of the family and the large teeth to the daughter. The face and jaws of the daughter may be small and the son's large. This causes an upset to our preconceived sense of what the esthetically correct individual should be like, and no artist searching for nature's forms will select them for models, yet the natural laws of heredity are carried out. The result is "Natural."

So, when I begin to probe by asking the patient, "Do you want natural looking teeth?", I always get an affirmative reply. But when I inquire further about the patient's concept of what natural is, I get totally different opinions. In the old days it was a waste of time to ask patients what type of teeth they would like. They wanted little ones and white ones. There is still a hangover of this concept. Gold crowns were introduced into artificial dentures at one time to make them look natural because many people wore gold crowns in those days. When gold crowns began to disappear from people's mouths we began to place inlays in artificial dentures, and now we stain the teeth to reproduce the blemishes which naturally occur on teeth. The introduction of methyl methacrylate has made the mucosal portions of artificial dentures difficult to detect and now dentures can in many instances be so created that even a dentist a few feet away from the patient cannot tell whether they are natural or artificial.

This does not create for us security from grief because, as I have already mentioned, the selection and arrangement of teeth may prove to be very costly to the dentist. Not only the patient but his relatives may have their own concept of the word "natural." When my patient replies to queries with the sentence, "I leave it all to you! You're the doctor!" I see before my eyes dollar signs floating out of the window. This sentence has cost me more money than any other sentence in my practice.

Let us say that you have delivered a denture which is the masterpiece of the month. You have put into this denture all the technical skill and artistry at your command and have convinced the patient of the esthetic qualities of your creation and the patient leaves the office pleased. When he comes home, the wife or the daughter screeches "What did he do to you? Your face looks like a horse!" Sometimes it would be better if we could have a convention of the family on the subject of Mother's or Dad's teeth. Indeed, in practice it has been suggested frequently that somebody vitally concerned with Mother's teeth comes along during the trying in stage. I have on occasion sent the waxed up set home with the patient so that the family may make certain of the esthetics. I believe it is good policy to tell the patient that after the final set up, no alterations regarding

esthetics will be made without an additional fee. Don't get this wrong. You may have gathered from my remarks that we overemphasize fees. We minimize rather than maximize fees in my practice. I am not a big fee man, but through bad experiences I have found that during construction of dentures we must add certain safeguards because of the psychological patterns to which individuals are subjected.

Do not underestimate human vanity. Few people go past a mirror without a sly glance. This does not exempt males, but special emphasis should be placed on female reactions to esthetics. Females are especially concerned with appearance from an early age to old age and they must be pretty old to admit the latter.

I recall a patient who was helped into my office by her chauffeur. She was about eighty years of age. Her face was a mass of wrinkles but she had painted a red patch of rouge on her cheeks surrounded by a stark white powder. She looked horrible! She wanted new white teeth. I acquiesced superciliously, knowing full well that I would not make her teeth very white. The teeth which I made functioned, I think, rather well but she returned in two years, expressed her displeasure, and demanded that I make her teeth as white as my cuspidor bowl, to which she pointed. I made her the whitest teeth I could get.

What is success in dentures? Is it *my* concept of what is right or is it the patient's? If a patient wears teeth which are constructed as accurately as I know how, and which, I believe, is the acme of perfection, and is made in accordance with all the esthetic values which my concepts dictate, could this be considered a success if the patient does not like the teeth or if some member of the family constantly irritates the patient by remarking about their poor appearance? The patient has to like the teeth. He looks at them every morning in the bathroom mirror. Besides, he won't be happy with the teeth if his family does not like them. Success includes all these factors. The end result must be happiness. So now I do not impose my sense of esthetics on the patient unless I am very certain it will be accepted. I try to discern his and the family's. I've frequently given a dissertation on esthetics to a patient, pointing out what should be the natural condition of a dentition at fifty years of age. Frequently, after this illuminating lecture the patient will timidly state, "I don't like dark teeth or teeth which are too spaced or crooked." If I made teeth in accordance with my own concepts, this patient would not be happy and the case would therefore, be a failure. Despite these disconcerting cases, the majority of my dentures are made according to standards which please me.

Unfortunately, the dentures I like do not advertise me too much because they are not recognized as being artificial. Many of my referrals come through dentures which I do not like personally. The patients and their friends frequently like them, however, and always the word "natural" is used when they look like "store teeth." As I said earlier the word natural means different things to different people.

FACIAL MUSCLES

Esthetics can get us into other problems. Very often patients may be helped by correcting the contours of the face through plumping out the cheeks and lips by means of thickening the buccal or labial mucosal portions of the dentures or by placing the teeth more to the buccal and labial, even though they are off the ridge. The appearance may also be improved by increasing the vertical dimension. All these things may be performed to a degree but must not be done excessively.

When we plump or overcontour the mucosal portions of dentures, we distend the lips and cheeks. The lips and cheeks, through their muscular activity, normally contact the teeth, gingivae and mucosa. The tongue does so similarly, particularly in the vicinity of the posterior teeth. Muscle length in adult persons is already a completed entity. By stretching the muscle fibres beyond their normal length through overplumping the dentures an atrophy of muscle fibres by pressure may be created. Intermittent pressure of short intervals is stimulating to tissue and encourages new growth wherever conditions are right, but constancy of

pressure causes resorption of tissue by pressure atrophy. That is why overplumping and improper placing of teeth on dentures will cause a loss of facial tissue. It is a principal factor in the alteration of the form of lip and cheeks.

On the other hand, nature demands function. When a limb is placed out of function the muscles and bones atrophy. This is termed "disuse atrophy." When, by placing teeth too far to the lingual the lips and cheeks are permitted to fall in, atrophy of disuse occurs and the lips and cheeks also lose their contour. The relationship of cheek and tongue to teeth and mucosa on artificial dentures should be maintained as nearly as possible to what they were originally on the natural teeth.

Similarly, the loss of vertical dimension plays havoc with the already determined mature muscle length. Decreasing the vertical dimension creates a great imbalance of the muscles which radiate in every direction like the spokes of a wheel about the orbicularis oris. These muscles all contribute their fibres to the content of the lip muscles. A diminution of their fibres will not only alter the facial contours but those of the lips. The lips, in turn, lose quantities of contributing and intrinsic muscle fibres and become thin and straighter. Cupid's bow then loses a lot of its attractive form.

Increasing the vertical dimension stretches muscles which ultimately tend to return to their normal length, like a stretched elastic band. This is one of the great causes of lesions appearing on the mucosa under dentures and of bone loss through resorption of the ridges by pressure atrophy. It is pointless to improve the appearance of the face for a short period of time by increasing the vertical dimension when we know that at a future date the facial muscles and the intraoral tissues will suffer permanent injury. This must be explained carefully to denture patients before work is started for we are not only concerned with cosmetic results but also with the physiology of the tissues.

TONUS

When discussing muscles and muscular balance we must not overlook other characteristics which muscles possess. Equilibrium of muscular balance is largely dependent on the tonal qualities of the muscle.

Perhaps this would be a good time to review muscle structure so that we may evaluate the possibilities of helping some of our patients. The tonal qualities of the facial muscles are important factors in the esthetics of a case.

We know that muscles are composed of many fibres. Each fibre, when it begins to contract cannot stop. All or nothing. In a muscle, fibres are continually contracting even when the muscle is resting. The fibres, however, do not all contract at the same time. They contract at intermittent intervals, which is fortunate for it gives the other fibres an opportunity to rest, thereby preventing fatigue.

Muscles are always opposing one another. The protagonists opposing the antagonists and the intermittenly contracting fibres maintain a balance. This keeps the muscles in a slight state of contraction known as "Tonus." Only a general anaesthetic or certain drugs will permit a muscle to relax completely.

The rate of the intermittent contraction as well as the quality and chemical content of each individual fibre are not constant. The state of the health of an individual is important in evaluating the tonal qualities of a patient. The factors could be numerous and could include such elements as age, hormones, function and nutrition. Also, there could be other complications, like infection and accidents.

The firmness of muscle tone is, of course, a factor in the esthetics of a denture. Very often, through wearing dentures, the patient will lose muscle tone of the face or lips. He literally loses face. It may be due either to a loss in the quantity of the muscle fibres or the chemical content of these fibres. Whatever the cause may be it is of great concern both to the patient and the dentist. In some respects the dentist may be of assistance but when the systemic factors are involved some cases may be beyond the dentist's control and the patient should be referred to a proper authority. Dentists are not responsible for facial alterations due to loss of tonus or other factors of health.

Dentistry, therefore, is concerned with an

interrelationship of psychologic, biologic and mechanical phenomena. Psychologically, dentistry is more involved perhaps than any other profession and the time has come when deeper studies on the subject should be made.

There are also the many biologic facets of prosthetic dentistry to consider which makes this branch of dentistry not only one of the most difficult to deal with but also the most interesting.

45 Avenue Road,
Toronto, Ontario, Canada.

LE PSYCHODYNAMICA E LE STUDIOS BIOLOGIC IN TANTO QUE ILLOS CONCERNE LE PROSTHODONTISTA

Dr. chir. dent. C. H. Moses (M.Sc.D.)

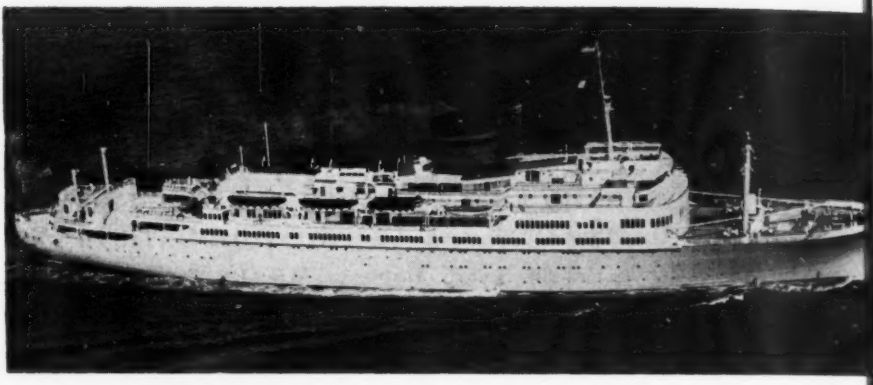
SUMMARIO IN INTERLINGUA

Le psychiatros e le psychoanalystas es familiar con le effecto therapeutic de permitter al patiente le exhauriente verbalisation de su problemas. Le majoritate del patientes con problemas de dentatura expecta adjuta ab le dentista in le mesme maniera in que le puero requesta adjuta ab patre e matre. De facto, il es ben possibile que certes del reportos de successo in multo difficile casos de dentatura se explica per le facto que un relation del typo patro-filial se ha disveloppate inter le dentista e le patiente. Con respecto al therapia psychoanalytic, il es ben cognoscite que frequentemente un tal relation se disveloppa inter le analysator e le patiente.

Le psychodynamica pote esser definite como "le systema e le theoria de nostre cognoscentias con respecto al comportamento e al motivation del comportamento de esseres human". Le dentistas se ha monstrate multo lente in recognoscer que le structuras oral es un area focal pro certe configurationes inusual de comportamento human. Il es pauco probabile que il existe un altere profession que ha melior rationes que le profession dental pro esser interessate in certe configurationes comportamental, simplemente proque le dentista se occupa del bucca e del dentes.

Il occurre frequentemente que le dentista se crede responsabile pro le non-successo de su travalio quando de facto le travalio es ben facite e le ver ration que explicarea le non-successo es un perturbation psychologic con etiologia obscur que solmente le experto de psychiatria o de psychoanalyse esserea qualificate a clarificar. Il deveni de plus in plus obvie que le dentista debe familiarisar se con argumentos de psychiatria, pro nulle altere ration que isto que ille debe recognoscer le situationes in que le problemas non es purmente dental.

American Academy of Dental Medicine



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2:15 P.M. Scientific Meeting
"Gaining Acceptance for Specialty Dentistry"
J. Lewis Blass, Ph.G., D.D.S., F.A.C.D., F.A.D.M.

...:30 P.M. Ladies Card Party — Sponsored by The Michigan Section

9:00 P.M. Honor Night

...day, May 28

6:45 P.M. President's Reception

7:45 P.M. Invitation Lecture and Buffet Dinner with the Bermuda Dental Society
"Systemic Effects on the Periodontal Tissues"
"Etiology, Diagnosis, Therapy"
Hermann Becks, M.D., D.D.S., F.A.C.D.

...nday, May 29

2:15 P.M. Scientific Meeting
Symposia:

(1) Diabetes and Periodontal Disease: William Greenhut, D.D.S.
Leslie Milne, D.M.D.
Differential Diagnosis of Oral Lesions: Earl Stone, D.M.D.

(2) The Dento-Medical Changes of the Gravid Patient
Psychological: David Campbel, D.D.S.
Somatic: Charles Conat, D.D.S.
Periodontal: Herman Lifton, D.D.S.
Other than Periodontal: Meyer Green, D.D.S.
Diseases of Pregnancy: Roger Lyons, D.D.S.
Post Partum Changes: Richard Christl, D.D.S.
Moderator—Don C. Lyons

Tuesday, May 30

10:00 A.M. Scientific Meeting
"Hormonal, Vitamin and Mineral Deficiencies and Their Effect on Oral Structures"
Hermann Becks, M.D., D.D.S., F.A.C.D.

Wednesday, May 31

9:00 P.M. Ladies Auxilliaries

Thursday, June 1

10:00 A.M. Scientific Meeting
"Industries Race in the Development of A Local Anesthetic" and "Preventing Emergencies in Dental Office"
James W. Lee, D.D.S.

Friday, June 2

9:00 A.M. Board of Trustees Meeting

10:00 A.M. Scientific Meeting
"A Simple Clinical Approach to the Treatment of Tempro-Mandibular Joint Dysfunctions"
Milton Hyman, D.D.S., F.A.C.D.

9:00 P.M. Award Nite

PHYSIOLOGIC FASTING BLOOD GLUCOSE: RANGE OR POINT?

E. CHERASKIN, M.D., D.M.D.* and W. M. RINGSDORF, JR., D.M.D., M.S.†

INTRODUCTION

There is still considerable discussion as to what should be regarded as the physiologic fasting blood glucose. The present concept of a physiologic range has been developed from an analysis of presumably healthy subjects. Even though such persons are not obviously ill, they may, nonetheless, exhibit subtle symptoms and signs.

It seems fair to assume that an individual *without* symptoms and signs is probably healthier than one *with* symptoms and signs[1]. Considering this assumption, a study is here presented of the fasting blood glucose range in a group of *symptomless* and *sign-free* subjects.

METHOD OF INVESTIGATION

One hundred dental patients seen for routine care were questioned for symptoms and examined for signs generally recognized as indicative of diabetes mellitus[2]. Though the main emphasis has been placed upon the oral cavity, some few extraoral symptoms (polyphagia, polydipsia, and polyuria) were also recorded. Each individual was also studied by means of the glucose tolerance test as described by Mosenthal and Barry[3]. For purposes of this report, only the fasting blood glucose determinations will be considered[4, 5, 6].

RESULTS

An analysis of fasting blood glucose was first made for those of the one hundred subjects free of a *single* symptom. Thus, the 82 subjects without polyphagia (though some may have had polyuria and/or polydipsia) showed a mean and standard deviation of 81 ± 21 mg. percent. A similar analysis of the 82 polydipsia-free patients (though some may have reported polyphagia and/or polyuria) yielded values of 81 ± 20 mg. percent. Finally, the 71 patients without polyuria (with possibly polyphagia and/or polydispia) netted a score of 80 ± 18 mg. percent. it is clear from an analysis of those patients lacking any one of these symptoms that the means and standard deviations are very similar. In order to construct a legible graph, Figure 1 shows only the mean and standard deviation for the 50 subjects without the extraoral symptoms of polyphagia, polyuria, and polydipsia (80 ± 20 mg. percent). In other words, no patient in this group reported either polyphagia, polyuria, or polydipsia. It is, of course, hazardous to draw sweeping conclusions from these observations. One of the principal objections to making definitive statements is the difficulty in quantitating symptoms such as polyphagia, polyuria, and polydipsia.

In order to establish the fasting blood glucose range on a more quantitatable basis, gingival health was studied. Sixteen subjects of the original one hundred demonstrated normal gingival hue, color, stippling, and the absence of pocket formation. It is important to emphasize that some of these patients may have reported extraoral symptoms previously mentioned. These 16 individuals were grouped as representative of perfect gingival status. It can be observed (Figure 1) that the mean (compared with extraoral symptoms) has decreased from 80 to 78 mg. percent. More important, the range of one standard deviation has been cut in half (± 20 to ± 11).

Similar analyses were made for the 38 subjects without oral symptoms (gingival tenderness, dry and burning mouth), dental findings (the 16 patients with a full complement of teeth and no clinical tooth mobility), and the absence of oral roentgenographic evidence of disease (no alveolar bone loss and no periodontal widening) in 11 persons. All of these values are depicted in sequence (from left to

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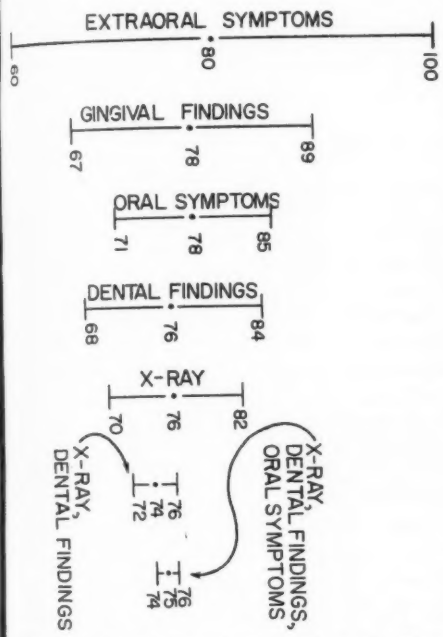

Figure 1. Mean and standard deviations of subjects *without* the above indicated symptoms and signs.

right) in Figure 1.

Finally, the groups of subjects without *combinations* of symptoms and signs were also studied. For example, Figure 1 shows the scores for the five patients without oral roentgenographic and dental stigmata of pathosis. Also shown (at the extreme right) are the values for the three subjects without x-ray, dental signs, and oral symptoms.

DISCUSSION

A number of points are worthy of mention. Two-thirds of the asymptomatic patients, in terms of these extraoral complaints, range from 60 to 100 mg. percent. This is the presently accepted range for fasting blood glucose normality[3]. Secondly, by employing different criteria, for normality, the mean decreases slightly and the range shrinks dramatically. Thirdly, by stiffening the requirements for health (the insistence of fewer symptoms and signs) the range shrinks to almost nothing. Fourthly, it is of interest that, as one elevates the standards for health, the mean age and range of the group decreases (Table 1). In other words, in the main, young individuals more often meet the requirements for health. Fifthly, it is clear from this evidence that there are statistically significant differences between some of the groups (Table 2). Finally, the natural question arises as to the experimental error in performing blood glucose determinations by different technicians and at different times. This has been checked by having two laboratory workers perform blood glucose values on the same sample at precisely the same time. Twelve blood samples were studied in this manner, and the

TABLE 1

group	*number of patients*	*mean age*	*standard deviation*
without extraoral symptoms	50	35.2	11.2
perfect gingival status	16	29.3	12.5
without oral symptoms	38	35.6	14.3
full complement of teeth and no clinical tooth mobility	16	28.9	9.7
no positive x-ray findings (no alveolar bone loss and no periodontal widening)	11	20.5	8.2
no positive x-ray findings, full complement of teeth and no clinical tooth mobility	5	21.8	4.4
no positive x-ray findings, no oral symptoms, full complement of teeth and no clinical tooth mobility	3	23.0	4.0

TABLE 2
P-VALUES OF ALL POSSIBLE GROUP COMBINATIONS

	gingival findings	*oral symptoms*	*dental findings*	*x-ray*	*x-ray dental findings*	*x-ray dental findings oral symptoms*
extraoral symptoms	.500	.500	>.200	>.200	>.050	>.100
gingival findings		.500	>.400	>.200	>.100	>.200
oral symptoms			>.200	>.200	<.010*	<.025*
dental findings				.500	>.400	.500
x-ray					.500	.500
x-ray-dental findings						>.200

*statistically significant

error ranged from 0 to 7 mg. percent. The mean difference proved to be 2.17 mg. percent, and in five of the determinations there was no difference between technicians. In addition, each technican was also required to perform two glucose determinations in succession on the same sample of blood. The error ranged from 0 to 8 mg. percent and the mean difference was 2.5 mg. percent. Thus, the differences "inter-technician" and "intratechnician" are small and quite consistent.

There is no question but that the sample is small. Therefore, this study should certainly be repeated with a larger group. Also, it would be highly desirable to carry out this same approach with other symptoms and signs and other biochemical determinations. Nonetheless, within the limits of these observations, this study suggests that physiologic fasting blood glucose seems to approach a theoretical point. However, from a practical standpoint, physiologic fasting blood glucose is represented by a small range due to the experimental error in the laboratory as well as other physiologic factors.

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The authors wish to acknowledge the editorial assistance of the following individuals: Drs. James W. Clark, William Mandel, Alvin L. Morris, Herbert S. Polin, Sol Silverman, Jr., Peter Simon, and S. Sigmund Stahl.

LE NIVELLO PHYSIOLOGIC DE GLUCOSA SANGUINEE IN STATO JEJUN: SCALA O PUNCTO?

Dr. med. e med. dent. E. Cheraskin e Dr. med. dent. W. M. Ringsdorf, Jr. (M.S.)

SUMMARIO IN INTERLINGUA

Continua le discussion de lo que deberea esser reguardate como le nivello physiologic de glucosa sanguinee in stato jejun. Le conception currente de un scala physiologic esseva derivate ab le analyse del valores in supponitemente normal subjectos. Ben que tal subjectos non es obviemente malade nonobstante illes pote exhibir symptomas e signos de character plus tosto subtil.

Il pare juste supponer que un subjecto sin obvie symptomas e signos es probabilemente plus san que un subjecto con tal symptomas e signos. Sin negliger iste supposition, un studio es hic presentate con respecto al scala de valores de glucosa de sanguine in stato jejun in un gruppo de subjectos sin symptomas e libere de signos.

Un numero de punctos merita esser mentionate. Duo tertios del patientes asymptomatic—i.e. asymptomatic con respecto a gravamines extra-oral—ha valores intra le scala ab 60 ad 100 mg per 100 ml. Isto es le currentemente acceptate scala de valores normal de glucosa sanguinee in stato jejun. Secundemente, per le application de altere criterios de normalitate, le nivello medie declina levemente e le scala se restringe dramaticamente. Tertiemente, per rigidificar le requirimentos pro le epitheto "in bon sanitate", i.e. per insister que minus symptomas e signos pote esser tolerate, le scala se restringe a quasi un puncto. Quartemente, il es interessante notar que in tanto que on eleva le standards de sanitate, le etate medie e le largor del scala de valores physiologic pro le gruppo declina. In altere parolas, a generalmente parlar, juvene individuos satisface le requirimentos de sanitate plus frequentemente. Quintemente, il es clar super le base de iste datos que il existe statisticamente significative differentias inter certes del gruppos.

THE HEALING OF GINGIVAL WOUNDS IN MALE RATS OF VARIOUS AGES

S. S. STAHL, D.D.S., M.S.

Aging of periodontal tissues has been studied in a variety of animals and in humans. Among the findings noted were downgrowth of the epithelial attachment, molar drift, continuous cemental apposition and a decrease in width of the periodontal membrane.[1-6] Associated with these changes was increasing gingival inflammation and pocket formation. However, the degree of gingival pathology appeared to vary with different species and around different teeth within the same animal group.[7-9] The present study attempted to investigate the healing response following an experimental gingival injury in male rats of different ages.

MATERIALS AND METHODS

Forty Long-Evans strain male rats weighing an average of 97 Gms. at the beginning of the experiment constituted the young group.

Forty Long-Evans strain male rats weighing an average of 386 Gms. at the beginning of the experiment constituted the older group.

Thirty six animals in each group received a gingival injury which consisted of scraping of the gingiva mesial to the maxillary left first molar to the level of bone.[10] Care was taken not to injure the bone itself. Four animals in each group were kept as untreated controls.

Following injury, 2 animals from each group were sacrificed according to the following time schedule: immediately, 1 hr., 3 hrs., 6 hrs., 24 hrs., 48 hrs., 72 hrs., 96 hrs., 5 days, 7 days, 9 days, 12 days, 15 days, 18 days, 21 days, 24 days, and 30 days post-injury. All control animals were sacrificed 30 days following the start of the experiment.

After sacrifice, the injured jaw and the submaxillary-sublingual glands were dissected out and prepared for histologic study. In addition to routine histologic staining, selected serial sections were stained with silver impregnation, PAS and PAS following diastase digestion and Van Gieson stain.

OBSERVATIONS

All animals gained weight during the experiment and no significant differences were noted between the daily weight increments of the wounded and control animals.

Histologically, collagen alterations associated with an increased fuchsinophilia (with PAS) in the tissues below injury was more pronounced in the young group than in the older animals during the early hours following injury. Inflammatory infiltration also occurred earlier in the young group. (Figs. 1-3)

Ninety-six hours after injury showed almost

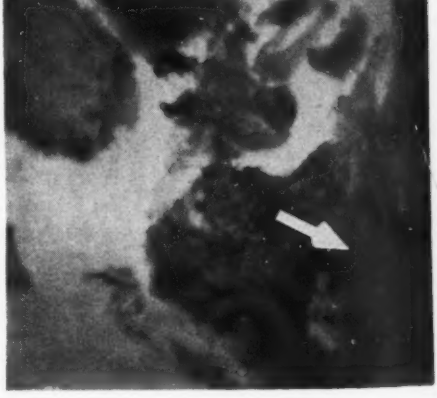

Fig. 1. Connective tissue below injury, 1 hour post-injury. Young rat. PAS stain. Magn. 140X. Note the fuchsinophilic (dark staining) fibers below injury.

From the Murry and Leonie Guggenheim Foundation, Institute for Dental Research and the Department of Periodontia and Oral Medicine, New York University College of Dentistry, New York, New York.
This study was supported in part by grants-in-aid- D-1103 and D-537 from the National Institute for Dental Research, National Institutes of Health, Bethesda, Maryland.

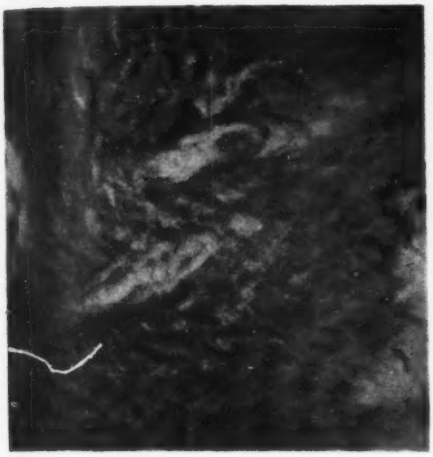

Fig. 2. Connective tissue below injury, 1 hour post-injury. Older rat. PAS stain. Magn. 140X. Note the lesser fuchsinophilia in these fibers as compared with those shown in Fig. 1.

complete epithelization and marked connective tissue proliferation at the wound site in the young animals. A reduction in inflammatory infiltrate was also noted at this time. By comparison, marked inflammation was still present in the older group five days post-injury. (Figs. 4 and 5)

As specimens of longer duration were observed, it was noted that sequestration of part

Fig. 3. Gingival tissue adjacent to injury, 3 hours post-injury. Young rat. H&E stain. Magn. 140X. Note the loss of nuclei in the subepithelial connective tissue.

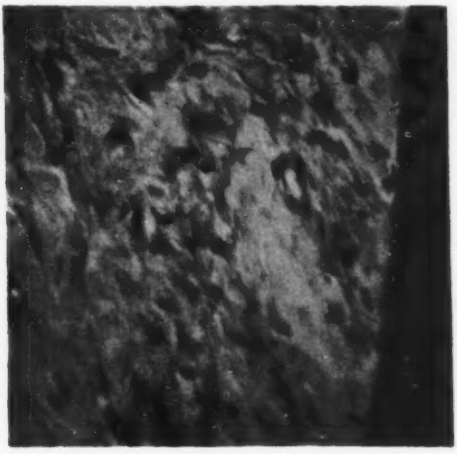

Fig. 4. Connective tissue below injury. 5 days post-injury. Young rat. H&E stain. Magn. 140X. Note the presence of many young connective tissue elements.

of the alveolar crest became prominent in the younger animals even though epithelization of the wound was complete. This was never seen in the older animals. (Fig. 6)

Repair of the bony crest following sequestra-

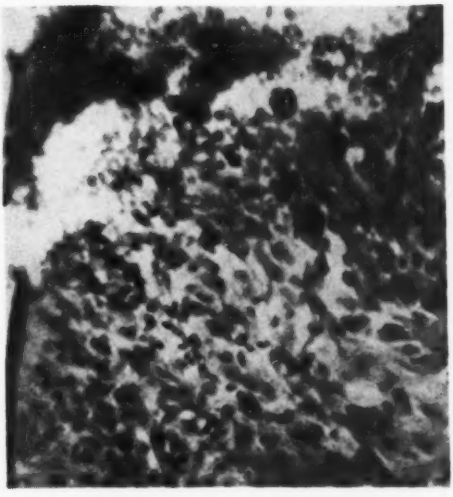

Fig. 5. Connective tissue below injury. 5 days post-injury. Older rat. H&E stain, Magn. 140X. Note the presence of a marked inflammatory infiltrate.

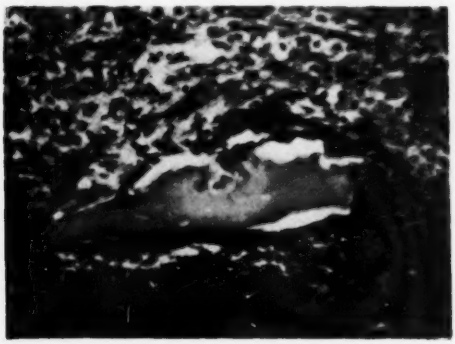

Fig. 6. Connective tissue below injury, 12 days post-injury. Young rat. H&E stain, Magn. 140X. Note the sequestrum.

Fig. 8. Alveolar crest injury, 22 days post-injury. Young rat. H&E stain. Magn. 140X. Note crestal osteogenesis and repair.

tion was prominent at about 18 days following injury and continued for the duration of the study. (Figs. 7 and 8) In the older animals, crestal apposition was seen after about 7-9 days post-injury, which persisted throughout the experimental period. (Fig. 9)

DISCUSSION

Of particular interest in this study was the earlier proliferation of epithelium and connective tissue seen in the younger animals following injury. This may be due to a more rapid turnover of collagen found in younger animals.[11] The more prominent fuchsinophilia (with the PAS reaction) seen in the injured tissues of the younger animals during the initial phases of healing may also be associated with more rapid fibroblastic activity since a close correlation between fibroblastic activity and the production of mucopolysaccharides has been shown in other healing studies.[12]

The formation of sequestra was noted in the later stages of healing in the young animals although care had been taken at the initial wounding not to injure the bone. This bone necrosis may represent an altered healing response in these young animals[13] possibly due to a lower resistance to infection at this early age.

Fig. 7. Alveolar crest below injury. 18 days post-injury. Young rat. H&E stain. Magn. 140X. Note the osteogenic activity.

Fig. 9. Alveolar crest below injury, 15 days post-injury. Older rat. H&E stain, Magn. 140X. Note the marked crestal osteogenesis.

SUMMARY AND CONCLUSIONS

Two groups of male rats of varying ages were subjected to an experimental gingival injury. The healing processes following injury were observed histologically.

It was noted that the initial healing process was somewhat faster in the young than in the older animals. Following initial epithelization of the wound, necrosis of portions of the alveolar crest below injury was seen in the young group only. Bone repair was noted following sequestration and was still present at the termination of this study.

The author gratefully acknowledges the technical assistance of Hilde Schmidl, A.B., and Sydell Leibowitz, A.B. in the preparation of this study.

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LE CURATION DE LESIONES GINGIVAL IN RATTOS MASCULE DE VARIE ETATES

Dr. chir. dent. S. S. Stahl (M.S.)

SUMMARIO IN INTERLINGUA

Le invetulation de tissus periodontal esseva studiate in un varietate de animales e etiam in humanos. Inter le constatationes del studio le sequentes es notabile: Es associate con le progresso invetulatori un crescentia in basso del attachamento epithelial, un displaciamento molar, un continue apposition cemental, e un reduction in largor del membrana periodontal. In concomitantia con iste alterationes, augmento del inflammation gingival e del formation de tascas esseva notate. Tamen, le grado del pathologia gingival variava apparentemente ab specie ad specie e ab un typo de dente al altere intra le mesme specie. Le presente reporto concerne specificamente un investigation del responsa de curation post lesiones experimental del gingivas in rattos mascule de varie etates.

Duo gruppos de rattos mascule de varie etates esseva subjicite a injurias gingival experimental. Le processo curatori post le injuria esseva observate histologicamente.

Esseva notate que le processo initial del curation esseva un pauco plus rapide in le juvene rattos que in le plus ancianes. Post le epithelisation initial del vulnere, necrose de portiones del cresta alveolar infra le injuria esseva incontrate solmente in le gruppo de rattos juvene. Reparo de osso esseva notate post sequestration e continuava esser presente al termination del studio.

SOME PRINCIPLES IN THE MANAGEMENT OF PAIN*

MILTON J. SCHIFFRIN, Ph.D.† and
MAX S. SADOVE, M.D.‡

The conquest of pain has fascinated and challenged man for countless centuries. References to pain are found frequently in the Bible. One might even consider the second chapter of Genesis to contain the first reference to anesthesia "And the Lord God caused a deep sleep to fall upon Adam, and he slept: and he took one of his ribs, and closed up the flesh instead thereof." The use of opium for the relief of pain is described in the early Babylonian tablets and the Ebers papyrus. In spite of this long history of man's concern with pain and its management, we still find it difficult to define pain. Perhaps Sir Thomas Lewis was wiser than most when he wrote: "Pain, like similar subjective things, is known to us by experience and described by illustration . . . to build up a definition in words or to substitute some phrase would carry neither the reader nor myself farther." The great Sherrington described pain as "the psychical adjunct of an imperative protective reflex." It appears that the best we can do is to describe some of the known characteristics of pain, and suggest methods of altering these factors in order to obtund pain.

Pain is a symptom and a sensation. One example should suffice to indicate the importance of pain as a symptom. A patient comes to the dentist with a complaint of pain. The pain is paroxysmal, and is *on* the gum and skin of one side. During an attack, there is motor spasm, flushing, and tearing of the eye on the affected side. The attacks seem to be precipitated by cold. This kind if pain is a symptom which indicates the possibility of trigeminal neuralgia (tic douloureux). The oral surgeon frequently has the opportunity and responsibility of making the diagnosis based on his knowledge of the meaning of this kind of pain as a symptom.

PAIN—A COMPLEX OF MANY FACTORS

Pain as a sensation is a complex of many factors. It can be appreciated by an understanding of the physiologic and psychologic components. The phenomenon of pain can be divided into the following three categories. One, those associated with the *transmission* mechanism, which includes all peripheral, spinal, and central neurophysiologic systems bringing pain *impulses* from the periphery to the thalamus. Two, those phenomena related to the *sensation* of pain, or the conscious awareness of pain in the body image. This includes all factors acting on or within the thalamocortical complex, which in the presence of consciousness, *integrate* and *interpret impulses* from the peripheral transmission system into a sensation of pain. Three, phenomena associated with the *reaction* to pain. These may be simple, involuntary or unconditioned reactions at any level of the transmission system, and are not necessarily impaired by a state of unconsciousness. Reactions involving the thalamocortical complex include the integration of pain sensations with those of other modalities and the determination of the over-all response to the sensation of pain. Reactions at this level are dependent upon a state of consciousness and the integrity of the thalamocortical system.

Many different physical and chemical stimuli can provoke excitation of a peripheral afferent fiber capable of conducting a pain impulse. This electrical impulse is carried by nerves, each of which has different physiologic and anatomic characteristics. The electrical discharges pass through a maze of interlocking or associated channels and eventually reach the thalamus. The thalamic-cortical complex receives, interprets, and reacts to these signals as pain sensa-

* Presented before the Seventeenth Annual Meeting of The American Institute of Oral Biology, The Hotel Riviera, Palm Springs, California, October 11, 1960.

† Clinical Assistant Professor in Anesthesiology, University of Illinois Medical School; Director of Clinical Research, Hoffmann-La Roche, Inc.

‡ Professor and Head, Department of Anesthesiology, University of Illinois Medical School.

tions. The over-all recognition of, and reaction to, this sensation is modified by the basic psychologic characteristics of the individual and how the pain sensation is integrated and interpreted among all the other signals indicating bodily and environmental changes. This crude outline of some of the factors entering into and affecting the complex we know as pain should suffice to indicate the infinite number of variations possible in the pattern of pain. This outline can also be used as a basis for describing some of the technics used in the management of pain.

MANAGEMENT OF PAIN

The most effective and desirable procedure is to remove the *cause* of the pain. Inflammation is a common cause of pain, hence all measures should be taken to reduce or prevent inflammation. Just as the surgeon is trained to handle tissues gently, so the dentist must avoid unnecessary trauma and injury during operative procedures. This principle of preventing pain should be a primary influence on every procedure. There is increasing evidence that the analgesic effects of the salicylates, are produced in largest part by their anti-inflammatory activity. If this is so, then it might be proper to consider these drugs as something other than analgesics, since they reduce the cause (inflammation) of the pain. Be that as it may, it appears that there is at least one important clinical consideration of this property in the practice of dentistry. That is, to treat the patient with salicylates before the procedure. For example, the administration of 600 mg. of aspirin an hour before operation may be very effective in controlling pain when inflammation is present or anticipated. Why must the dentist wait until pain and inflammation are present before he gives salicylates?

The second general method in the management of pain is to destroy conduction in the peripheral nerves. This can be done chemically or surgically at almost any level below the thalamocortical complex. The peripheral interruption of nerve conduction is the dentists' mainstay in the prevention of pain. The distribution of the nervous pathways from the teeth centrally, and the character of the surrounding tissue, are admirably suited to the blocking of conduction by the use of the local anesthetics. In the absence of widespread inflammation or similar contraindications, the local anesthetics come close to the ideal analgesic for dental practice. The dense, close-knit tissue of healthy gums and palate tend to contain the anesthetic in the site of injection and delay the rapid absorption of these drugs, although the vascularity of these tissues favors more rapid absorption. From a theoretical standpoint, if nervous conduction from the periphery can be blocked, there should be complete analgesia.

The third method is to abolish the sensation of pain. This can be accomplished with certainty only by the general anesthetics. These agents are primarly effective by virtue of their action on the thalamocortical complex. The loss of consciousness which they produce abolishes the sensation of pain, but it must be appreciated that they do not necessarily negate all physiologic reaction to pain. The hazards and disadvantages of general anesthetics must be weighed against their advantages whenever their use is contemplated. The mode of action of the systemic analgesics is not defined clearly. In general they raise the pain threshold, and although some of them alter the *reaction* to pain, they are included in this section as a matter of convenience. The non-addicting systemic analgesics include the salicylates, paraamino phenol derivatives (phenacetin and acetanilid), pyrazolones (antipyrine and aminopyrine), dextro propoxyphene (Darvon), and ethoheptazine (with aspirin-Zactirin). The characteristics and limitations of the older compounds are well established. Darvon and Zactirin are newer drugs and your own personal experience with these is of greater value to you than anything I might tell you. The importance of these two compounds is that they are not addicting. At the University of Illinois, Dr. Sadove, Dr. Ali and I have been studying a new analgesic that also seems to have a very low addiction liability. This drug, Ro 4-1778/1 has been used primarily for the relief of pain in

patients on the orthopedic service. It is as potent as codeine and seems to be free of some of the undesirable characteristics of codeine. Preliminary studies with this drug in dentistry are now in progress.

USE OF NARCOTICS

The primary indication for the use of the narcotics is severe pain that cannot be controlled by other means. Narcotics are not to be used for their secondary effects such as sedation or hypnosis. The relief of human pain and suffering provided by the narcotics is a monumental achievement. The misuse of narcotics, and the hideous spectacle of addiction are among the most dangerous abuses of these drugs. All of the narcotic analgesics have the following properties in common although there are variations in degree: analgesia, tolerance, addiction, depression of the central nervous system and numerous side effects referable to the gastrointestinal and other systems. A summary of some of the characteristics of the narcotics is presented in Table 1.

The last, and in many ways the most important, of the general methods in the management of pain is the supression of the *reaction* to pain. All of you are familiar with the situation wherein the patient says that he still feels some pain but that it doesn't "bother" him. In many cases, this kind of response is the goal of our treatment. The reaction to pain is the most complex of all the facets of pain, and it follows that therapy in this area is the most variable. At least the following contribute toward the patient's reaction to pain: his basic personality, previous experience with pain, his society and its mores, religion, the site of the pain, his interpretation of the environment surrounding the pain episode, and above all—what the pain means to him. The reduction of fear and anxiety are important principles in this phase of the management of pain. Narcotics have been misused for this purpose, and as has been so aptly stated "the trouble with narcotics is they lull both the physician and patient to sleep." There are safer and more effective ways of obtunding the patient's reaction to pain. This important phase of practice begins as soon as the patient enters the waiting room. The judicious and intelligent use of placebos may be very rewarding. For example, the dentist may prepare to give the patient a white placebo capsule while in the waiting room, hesitate, and then say, "No, I think I'll give you something stronger"—and proceed to give the patient a red placebo capsule. This is not a trick or a deception practiced on the

Table 1

SOME CHARACTERISTICS OF NARCOTICS

Generic name	Trade name	Equivalent analgetic dose (mg)	Maximum analgetic intensity	Duration of analgesia	Sedation	Route of administration			
						Oral	S.C.	I.M.	I.V.
Morphine	morphine	10	2	3	3	1	3	3	3
Codeine	codeine	65?	1	2	1	2	3	3	
Dihydrocodeinone	Hycodan	10?	1	2	1	2	3		
Meperidine	Demerol	100	1	2	2	2	3	3	3
Dihyromorphinone	Dilaudid								
	Hymorphan	2	3	2	3	2	3	3	
Metapon	Metapon	3	3	2	1	3			
Methadone	Methadone & others	10	3	3	2	3	3	3	
Alphaprodine	Nisentil	20	3	1	1		3	3	3
Levorphanol	Levo-Dromoran	2	3	3	2	3	3	3	3
Phenazocine	Prinadol	2	3	3	3			3	3
Anileridine	Leritine	25	3	3	2	3	3	3	3

1- Comparatively slight effect or duration
2- Comparatively moderate effect or duration
3- Comparatively marked effect or duration

patient; it is instead a surprisingly effective way to help the patient help himself.

The manner, deportment, and all of the actions of the dentist and his associates should be directed toward the instillation of confidence and trust. The most effective means of obtaining the patient's confidence is to earn it. Analgesia sufficient to overcome the patient's pain should be provided so that his total experience in the office teaches him that he will not be made to suffer.

The tranquilizers are very useful in obtunding the reaction to pain. Through the judicious use of the tranquilizers it is frequently possible to avoid the use of more dangerous drugs and procedures. An interesting new possibility exists as the result of our preliminary studies at Illinois. We demonstrated in experiments on mice and rabbits that the tranquilizer, Librium, protects these animals against procaine-induced convulsions and toxicity. It would be most helpful clinically, if a tranquilizer could be used which would protect against the toxicity of local anesthetics. A discussion of the tranquilizers and their characteristics appears elsewhere.

Hypnosis is an important technic, and there is no question of its effectiveness. The difficulties in the use of hypnosis arise from the small number of competent practitioners, and the general public reluctance to accept this technic.

In summary, the management of pain challenges the resources and ingenuity of the practitioner. Not only must he know the tools and technics, but he must also be aware of his own reactions to the patient whose pain defies his treatment. He must be prepared to exercise all the tact, patience, persistence and empathy he can command. The key to the entire problem lies in the question—"what does the pain mean to the patient?"

CERTE PRINCIPIOS IN LE TRACTAMENTO DE DOLOR

Dr. phil. Milton J. Schiffrin
Dr. med. Max S. Sadove

SUMMARIO IN INTERLINGUA

Le dolor es un symptoma e un sensation. Un sol exemplo suffice pro indicar le importantia del dolor como un symptoma. Un patiente se presenta al dentista con le gravamine de dolor. Le dolor es paroxysmic e es locate in le gingiva e le pelle de un latere. Durante un attacco il occurre spasmo motori, rubor, e lacrimation del oculo al latere afficite. Le attaccos es apparentemente precipitate per frigido. Iste typo de dolor es un symptoma que indica le possibilitate de neuralgia trigeminal (tic douloureux). Le chirurgo oral ha frequentemente le opportunitate e le responsabilitate de establir le diagnose super le base de su comprension del signification de iste typo de dolor como symptoma.

Hypnose es un technica importante, e il existe nulle dubita con respecto a su efficacia. Le difficultates in le uso del hypnose resulta ab le basse numero de competente practicantes e ab le disinclination general del parte del publico de acceptar iste technica.

In summa, le tractamento de dolor require alte grados de habilitate e de ingenuitate del parte del practicante. Ille non solo debe cognoscer le instrumentos e technicas sed ille etiam debe esser conscie de su reactiones personal verso le patiente con dolores que resiste su tractamento. Ille debe esser preste a exercer omne le tacto, le patientia, e le persistentia que ille pote mobilisar. Le clave a omne aspectos del problema se trova in le question: "Que es le signification del dolor pro le patiente?"

Medical Views on Oral Problems

TRIGEMINAL NEURALGIA*

TO THE EDITOR:—*Is there any known cause of trigeminal neuralgia, discounting cases in which there are tumors inside of, or pressing on, Meckel's cavity?*

Harvey A. Lewis, M.D., Beverly Hills, Calif.

ANSWER.—With the exception of the rare case of a tumor in the region of Meckel's cavity, the specific cause of trigeminal neuralgia is still unknown. Although there are many theories, documented pathological verifications have been few and non-consistent. Some have maintained that the cause is peripheral in origin, e.g., Humphery (in Harris W.: *Neuritis and Neuralgia,* New York: Oxford University Press, 1926, p. 172). Others have suggested that the condition is associated with degeneration or arteriosclerotic changes in the gasserian ganglia. Trigeminal neuralgia, too, has been reported as occurring frequently in patients with multiple sclerosis. Lewy and Grant (*Arch Neurol Psychiat* 40: 1126, 1938) described foci of softening within the lateral and medial nucleus of the optic thalamus or in the thalamocortical tract. They believed their studies showed that the pathological changes were the result of angiopathies, primarily on the background of arteriosclerosis.

A consensus of neuropathologists, however, concurs that the cause of trigeminal neuralgia has still not been unequivocally clarified.

MORTON MARKS, M.D.

* Questions & Answers, J.A.M.A., March 4, 1961, p. 832.

WHAT IS THE FUTURE OF OUR MEDICAL LITERATURE?*

TO THE EDITOR:—*A tremendous increase in useless, un-original, and non-contributing medical literature has been noted recently in this country. If this continues, we will soon need a special evaluating agency which will list papers according to their value and thus save our time. But this is not all!*

I have recently noticed another ridiculous phenomenon: the exact repetition of a paper with the same (or slightly modified) title and its simultaneous publication in three or more journals of the same specialty discipline. For example, there was a paper recently on "antrectomy and vagotomy" which was published in three different surgical journals, and possibly in some other journal which I just couldn't find the time to consult, at the same time, repeating almost every single word.

George Majnarich, M.D., LeSage Clinic
114 E. Everett, Dixon, Ill.

* Letters to the Journal, J.A.M.A., March 4, 1961, p. 822.

AUDITORY ANESTHESIA*

TO THE EDITOR:—*How effective is the so-called auditory anesthesia in which a musical background and a masking tone controlled by the patient is used? Is there any likelihood of acoustic trauma from its use?*

P. W. Snelling, M.D., Hartford, Conn.

ANSWER:—I have not used the type of anesthesia referred to, and I know of no leading scientists in the field of analgesia or anesthesia who have reported on this method. This worries me. I miss the endorsement of such persons. I suspect it is a harmless instrument that is capable of facilitating hypnosis. Whether it is better than the photic or verbal stimulus, I honestly cannot say, and I doubt if anyone can. It can be said, however, that it is not unpleasant.

With those instruments now on the market that use some form of intense noise, there is definitely a potential hazard to hearing, and it is advisable to use some caution in applying them. The degree of caution depends on the instrument used and the intensity of source and auditory stimulus.

MAX S. SADOVE, M.D.

* Questions and Answers, J.A.M.A., Feb. 18, 1961, p. 644.

GAGGING REFLEX*

TO THE EDITOR:—*A 52-year-old man who has a diaphragmatic hernia complains of gagging. The upper jaw is edentulous, and the lower jaw has a partial plate. He is able to chew well and swallow a full meal without any difficulty. Soon after eating a complete meal, he begins to gag, and he is unable to keep his upper plate in his mouth. When he removes this plate, the gagging stops. He is unable to replace this plate until the next meal. If he does put it in again, he will start gagging. I have tried using atrophine-like drugs to help him. This has not succeeded. I would like your suggestion for possible relief other than an operation to correct the hernia.*

James G. Makol, M.D., North Miami Beach, Fla.

ANSWER.—The facts as stated suggest that the upper plate rather than the hiatus hernia sets off the gagging reflex. I would suggest that you follow this procedure. 1. Have the upper plate checked by a dentist for proper fitting and, if it does not fit properly, advise the patient to obtain one which does. 2. If the plate does fit properly, observe the behavior of a thick barium-water mixture in the esophagus and fundus of the stomach fluoroscopically with and without the upper plate in place as he ingests a meal. The observation should be made in both the

erect and supine positions. This may furnish a clue as to whether the hernia is responsible. 3. Have the patient suck on an anesthetic lozenge after completing a meal to see whether the upper plate could then be tolerated without gagging.

THOMAS E. MACHELLA, M.D.

* Questions & Answers, J.A.M.A., Feb. 18, 1961, p. 643.

FLUORIDE TABLETS*

TO THE EDITOR:—*I have a brochure from my dentist describing a flouride tablet marketed under the trade name Karidium. Our community does not enjoy the benefits of flouridated water. Is the use of tablets as effective and safe as fluoridated water in reducing dental caries in children?*

ANSWER:—The Council on Dental Therapeutics of the American Dental Association has issued a report on prescribing supplements of dietary fluorides. A number of safeguards are outlined in this report, and it would require too much space to enumerate them in this reply. I would suggest that interested readers refer to a report of the Council on Dental Therapeutics (*JADA 56:*589-591, 1958). The agent mentioned in the above inquiry is now accepted for advertising in the *Journal of the American Dental Association.*

H. TRENDLEY DEAN, D.D.S.

* Questions & Answers, J.A.M.A., Jan. 14, 1961, p 175.

EPILEPSY AND HYPOGLYCEMIA*

TO THE EDITOR:—*A workman claims a grand mal seizure was caused by a hypoglycemia from failure to eat breakfast. Such attacks can be induced by an overdose of insulin, but a convulsion due to metabolic hypoglycemia seems far fetched. Is there any scientific evidence that a seizure can result from skipping a meal?*

H. L. Herschensohn, M.D., Santa Monica, Calif.

ANSWER:—The brain is very sensitive to a reduction in the blood sugar level, and, when this falls to a very low point, convulsions may occur. The hypoglycemic state may be the result of functional hyperinsulinism, organic hyperinsulism, or massive doses of insulin, as in the treatment of psychotic states.

The important thing to bear in mind is that reduction of glucose metabolism of the brain and its restora- hypoglycemic symptoms and their relief. If the rate of fall of the blood sugar level is rapid, the symptoms are those of compensatory overproduction of epinephrine such as sweating, weakness, hunger, and tachycardia as a compensatory mechanism and not convulsions. If the blood sugar falls slowly to a low level over a period of hours, convulsions may occur. Thus, it is almost impossible that the missing of one meal tion to normal are closely associated in time with the could produce a convulsion. The drop in the glucose level is always slow to a point where the brain responds, as it were, to cerebral anoxia. There is no scientific evidence that a seizure can result from skipping a meal.

EDWARD D. SCHWADE, M.D.

* Questions & Answers, J.A.M.A., Feb. 25, 1961, p. 738.

BLOOD SUGAR LEVELS IN DIABETES*

TO THE EDITOR:—*In the Questions and Answers section of* THE JOURNAL, *Dec. 10, 1960, page 2001. there is a discussion of diabetic screening. This brings up the general problem of when it is advisable to check blood sugar levels in outpatients. During the years that I have been in practice, I have found it of great value* not *to check fasting specimens, but to check the blood sugar level after the patient has eaten. In this way, one can often pick up early diabetes which would be missed if only a fasting blood sugar level were obtained. In the regulation of diabetics, it is much better for blood sugar levels to be determined before lunch or before dinner rather than during fasting; blood sugar levels at the former times give the physician a much better idea of the patient's true regulation.*

The glucose tolerance test is rarely necessary to decide whether a patient has diabetes. If one makes a blood sugar level determination 2 to 3 hours after the patient has eaten a high carbohydrate meal, one can usually determine if carbohydrate tolerance is impaired. Besides being difficult and laborious, the glucose tolerance test is not without danger in a patient who is bordering on ketosis, and certainly should not be performed when the fasting blood sugar level is elevated.

Harry F. Klinefelter Sr., M.D., Baltimore 2, Md.

* Letter to The Journal., J.A.M.A., March 18, 1961, p. 1024.

Book Reviews

Anatomy for Students of Dentistry, by James Henderson Scott, D.Sc., M.D., L.D.S. and Andrew Derart Dixon, M.D.S., B.Sc., Ph.D. The Williams & Wilkins Company, Baltimore, Md. 484 Pages, 288 illustrations, $11.00.

This volume has been published as a guide rather than a reference text for dental students. As would be supposed the major portion is devoted to the head and neck with a chapter on the anatomy of the thorax and abdomen.

Of particular interest are the sections on the development of the head and neck region and the one on clinical anatomy. The latter, while brief, is an excellent source of information concerning the path of dental infections and carnio-facial pain.

The good organization and the great number of illustrations make this text worthwhile as a ready reference source for the practitioner.

ALEXANDER SOBERMAN

The Evolution of Dental Education, by John E. Gurley, D.D.S., F.A.C.D. American College of Dentists. St. Louis, 276 pages, 1960.

At first glance it might seem that this volume is a compilation of a series of dates and events. It soon becomes apparent however, that the author is a venerable gentleman with a magnificent flair for writing and has succeeded in making this printed record read like an historical novel.

Judging from the credit lines, (Historian, American College of Dentists, 1908-1928), Dr. Gurley has been active in the field of Dental Education for over a half-century and yet his thinking and approach to the current problems are as fresh and as acute as that of anyone today.

This publication will help fill a void in the general dental literature and to anyone who is in any way interested in the subject of dental education, and that should mean every practitioner, this book is most certainly recommended.

ALEXANDER SOBERMAN

Fortschritte der Kiefer- und Gesichts-Chirurgie, ein Jahrbuch, Band VI, von Dr. Karl Schuchardt, Georg Thieme Varlag, Stuttgart, 1960, 116 marks.

This yearbook of maxillo-facial surgery reports advances in the pathology, diagnosis and treatment of diseases of the jaws, temporomandibular joint and salivary glands. Normal and anomalous embryologic development is considered emphasizing infectious and genetic effects as they influence the normal development of the neural bar.

Temporomandibular joint physiology, radiology and function, and the effects of dysfunction and of arthritis on the soft and hard tissues of the joint are presented. Muscle dysfunction as it controls the function of the joint as well as the Pierre Robin syndrome are considered. The treatment of injury, luxation, arthropathies, and other diseases, deformities and dysfunctions of the joint are considered.

The secretion of saliva, its functions and changes in disease, are described along with a discussion of the pathology of the salivary glands. The latter is often related to systemic disease.

A number of articles dealing with surgery of tumors of the salivary glands are included. Treatment of their infections is covered and, in the presence of chronic inflammation, the removal of the gland is advised.

Other articles included in this pathologic and surgical review are on sialolithiasis, surgical nerve injury, defects of salivary glands arising from metabolic defects, percutaneous biopsy, radiotherapy of tumors, protection of the facial nerves during surgery, systemic causes of salivary gland dysfunction, treatment of ranula, Sjorgen's syndrome, virus infection of the salivary glands, the complications of mumps, salivary fistula, and the treatment of repeated luxation and subluxation of the temporomandibular joint are discussed.

Over 200 illustrations of unusually good quality accompany the text whose limitations are imposed by the abstract nature of the articles included. The text, type and format are of high quality and the English summaries rewarding and complete enough to make reading of the summary and study of the text worthwhile for any reader.

J. LEWIS BLASS

Outline of Histology, Hoskins, M. M. and Bevelander, G. Fourth Edition, C. V. Mosby, St. Louis, 111 pages, illustrations, 1959, $4.75.

This is the fourth edition of a very popular laboratory manual that is usually used as a companion to the microscope in studying both general and dental histology. This critic used the first edition back in 1942, as a dental student, and although there has been some use of the microscope there has been much use of this outline. The reasons for this become obvious when one reads this very fine manual. In both the general and dental histology, each subject is presented in a way that all the important material is right at hand, and the wonderful black and white illustrations make the text clear. A practitioner interested in reviewing his histology would do well to have this new edition.

It has become increasingly evident that in the future the main role of dentistry will be prevention. It is obvious that prevention must begin with the understanding of normal tissues, because it is only through the understanding and appreciation of the normal or healthy tissue that successful treatment of general and dental pathology can be accomplished.

Dr. Bevelander is to be congratulated on keeping this wonderful manual up-to-date and lucid.

N. WACHTEL

The Metabolism of Oral Tissues, Annals of the New York Academy of Sciences, Volume 85, Art. 1, New York, March 29, 1960, 499 pages.

With the phenomenal growth of information concerning the biologic mechanisms involved in the oral cavity which has become available during the last decade, it is not at all surprising that a common forum be held during which some of this knowledge could be publicly disseminated.

This publication represents the proceedings of one of the first of such conferences and was held under the sponsorship of the New York Academy of Sciences. Herein are represented some of the most outstanding investigators in the field of dental research. While much of the data is strictly "pure science" in nature and technically detailed, there is sufficient information of a clinical nature to make it of value to the practicing dentist.

Under such headings as, tooth tissues, salivary glands, the tongue and oral mucosa, and periodontal tissues, practically all phases of metabolism are discussed. This volume represents a good cross-section of some of the avenues along which current dental research is progressing and should indeed be a stimulus to those few who have felt that there are no profound investigative efforts in dentistry.

ALEXANDER SOBERMAN

Radiation Protection and Dentistry, by Arthur H. Wuehrmann, D.M.D., C. V. Mosby Company, St. Louis, 238 pages, illustrated, 1960, $6.50.

The public has become increasingly aware of the hazards of the X-ray during the last fifteen years. The dentist must be equipped to answer all his patient's questions if he hopes to maintain confidence in the use of the X-ray. Dr. Wuehrmann has written a clear and concise book on the management of the X-ray. Chapter headings include: Fundamental Effects of Radiation on Matter, Physical Principles of X-Radiation and Injurious Effects of X-Radiation. Also discussed are chapters on Prevention of Radiation Injury, Methods of Reducing Radiation Injury, Legal Aspects and A Survey of the Literature.

This book is an excellent review for the practitioner and student on radiation protection and a welcome addition to every dental library.

Synopsis of Oral Pathology, by S. N. Bhaskar, B.D.S., D.D.S., M.S., Ph.D., C. V. Mosby Company, St. Louis, 502 pages, illustrated, 1961, $9.75.

This book is an excellent bird's eye-view of the field of oral pathology. It is written for the dental practitioner and dental student in an easy to read manner. The book is divided into two parts. Part one classifies oral lesions according to their clinical appearance. This is excellent for the clinician since he doesn't have laboratory facilities available when he examines a patient. The practitioner must attempt to make a diagnosis on the basis of clinical features alone, hence this type of classification is of prime importance. Part two represents distillation of what is known about oral pathology. The material is subdivided into general principles of oral pathology, pathology of the teeth and jaws, pathology of the oral mucosa and tongue, pathology of the salivary glands and special oral pathology.

The material is presented in outline form and accompanied by clear pictures and photomicrographs. A bibliography appears at the end of each section. This book is a worthwhile investment for practitioners and students.

A Handbook of Differential Oral Diagnosis, by Major M. Ash Jr., B.S., M.S., D.D.S., C. V. Mosby Co., St. Louis, 234 pages, 1961, $6.50.

This is another book in the famous postgraduate dental lecture series that is being published by the C. V. Mosby Co. This textbook of signs, symptoms, and diseases was compiled primarily to aid the dental practitioners and students in evaluating the many manifestations of disease occurring in the mouth and surounding structures. Differential Diagnosis refers to the diagnosis of a disease by systematically comparing and contrasting the signs and symptoms of several diseases. This handbook is not intended to be all inclusive but rather a brief and practical index of the oral manifestations of disease. It is arranged so the evaluations of diseases may be made on the basis of signs, symptoms, etiology and anatomic location. Cross references are included in the body of the text as well as in the index.

This is an excellent handy reference volume for the general practitioner who can secure information about oral diagnosis easily and rapidly.

Review of Dentistry, Edited by Maynard K. Hine, D.D.S., M.S., Third edition, C. V. Mosby Company, St. Louis, 576 pages, 1961, $9.00.

This book is an excellent review of the entire field of dentistry for the student or practitioner preparing for National or State Board Examinations. The first two editions of this book were edited by Dr. James T. Ginn who recently passed away and Dr. Maynard

K. Hine has done an excellent job in editing this latest edition. The book has been thoroughly rewritten and reorganized. Some thirty contributors have participated in writing this manuscript and each chapter has been reviewed by at least three individuals, so that the material is authoritative and is representative of current opinion.

Dr. Hine points out that no attempt has been made to be certain that all contributors present identical viewpoins. Different opinions on many controversial issues are reflected throughout the book. The four common types of examination questions, the "essay" type, "multiple choice," "true and false," and "completion" are amply represented in this book.

This text will serve as an excellent review for both student and practitioner in the preparation of board examinations.

The New Year Book of Dentistry, Edited by Stanley D. Tylman, D.D.S., Donald A. Keys, D.D.S., John W. Knutson, D.D.S., Harold J. Noyes, D.D.S., Hamilton B. G. Robinson, D.D.S., and Carl W. Waldron, D.D.S., Year Book Medical Publishers, Inc., Chicago, 480 pages, 282 illustrations, $7.50.

The New Year Book of Dentistry contains scores of significant world-wide advances which shed important light on the new diagnostic and therapeutic procedures applicable to the type of cases seen most frequently. The very best articles that have appeared in the literature during the last year have been abstracted and classified according to their major subdivision in dentistry. Wherever possible the editors have sought out the original photographs and have selected the best ones to illustrate the abstract that appears in the Yearbook.

The practitioner can save many hours searching the literature by annually reading the latest Yearbook of Dentistry. If he desires to go back to the original article, the Yearbook Publishers list at the bottom of each page the Journal, Volume number, pages and date the article was originally published.

Academy Proceedings

AMERICAN ACADEMY OF DENTAL MEDICINE MID-WINTER MEETING HEARS DENTAL SPECIALISTS DISCUSS "THE PATIENT"

Dr. Charles H. Moses Dr. Max S. Sadove

The 1960 Mid-Winter Meeting of the American Academy of Dental Medicine was held on December 4, 1960 at the Hotel Sheraton-Atlantic in New York City. More than 150 academy members and friends were present for luncheon and a scientific session in which a symposium on "The Patient" was held. Special emphasis was placed on the analysis of the patient from the physical and psychological standpoint.

The interested audience heard Dr. Max S. Sadove, M.D., Professor of Surgery (Anesthesiology), Head of the Division of Anesthesiology, Research and Education Hospitals, University of Illinois, College of Medicine; and Dr. Charles H. Moses, D.D.S., B.Sc., M.Sc., Lecturer at the University of Toronto, in charge of Prosthetics at Mt. Sinai Hospital (Toronto), discuss "The Patient." Dr. Sadove is an internationally known anesthesiologist whose remarks on patient management were of extreme interest. Dr. Moses, famous Canadian prosthodontist, discussed the trials and tribulations of full dentures.

An interesting question and answer period followed these two excellent essayists.

Our thanks to Dr. Stephen Nachbar, Chairman, and Dr. Howard Ward, Co-chairman for the excellent program. The program committee is to be congratulated for a job well done.

Academy Past Presidents at Midwinter Meeting: (L. to R. Seated) Dr. George F. Clarke, Dr. S. Leonard Rosenthal, Dr. George G. Stewart, and Dr. William M. Greenhut. (L. to R. Standing) Dr. George Bruns, Dr. Sidney Sorrin, Dr. Harold R. Gelhaar, and Dr. J. Lewis Blass.

Midwinter Meeting Committee: (L. to R. Seated) Dr. Howard L. Ward, Co-chairman; Dr. Stephen Nachbar, Chairman; and Dr. Rudy Palermo. (L. to R. Standing) Dr. Seymour Koteen, Dr Irving Yudkoff, Dr. Henry I. Greene, Dr. Angelo Cacciatore, and Dr. Abraham Reiner.

ACADEMY PRESIDENT STUDIES MIDWINTER PROGRAM WITH CO-CHAIRMEN

Midwinter Chairman, Dr. Stephen Nachbar (Left) and Dr. Howard L. Ward, Co-Chairman (Right) discuss highlights of program with Academy President, Dr. Hermann Becks (Center), prior to the commencement of the afternoon scientific session.

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Baltimore, Maryland.

DR. RUDOLPH W. PALERMO
111 Larch Drive
New Hyde Park, L.I., N.Y.

Dear Dr. Palermo:

I will attend the fifteenth Annual Meeting of The American Academy of Dental Medicine from Friday, May 26th to Saturday, June 3rd, 1961, on the Cruise Ship "OCEAN MONARCH" to Bermuda and Nassau.

( ) Enclosed is my check for $10.00 to cover Registration Fee.

DR. .....
(Please print)

Address .....

.....

Announcements

POSTGRADUATE TRAINING IN PERIODONTIA AND ORAL MEDICINE NEW YORK UNIVERSITY COLLEGE OF DENTISTRY

The following postgraduate courses in Periodontia and Oral Medicine will be offered at the New York University College of Dentistry and will be given by Dr. Sidney Sorrin and associates:

No. 124.02. REFRESHER COURSE IN PERIODONTIA AND ORAL MEDICINE

Ten sessions, Wednesday, 4:00 to 6:00 P.M. March 1, 1961 to May 10, 1961.
Tuition and books. $156.00. Instruments approximately $55.00.

Theoretical and practical application of periodontal diagnosis and techniques to general dentistry. Four lecture and six clinical demonstration sessions. Equilibration of occlusion is performed by the student on casts. Patient demonstrations include equilibration of occlusion, conservative and radical therapy, home care, etc.

No. 123.02. PERIODONTIA AND ORAL MEDICINE IN THE SPANISH LANGUAGE

Four weeks, Monday through Friday, 9:00 A.M. to 4:00 P.M.
April 10 to May 5, 1961 inclusive. Tuition including books and instruments approximately $385.00.

Theoretical and practical application of Periodontia and Oral Medicine is fully explained and demonstrated. Equilibration of occlusion is performed by the student on casts. Lectures and clinical demonstrations of diagnosis and treatment planning, conservative and radical techniques, equilibration of occlusion, home care, etc. The entire course is conducted in the Spanish language.

COMPREHENSIVE PREPARATION IN PERIODONTIA AND ORAL MEDICINE

No. 120.11 and 121.11. Two academic years, full time, September 19, 1960 to May 25, 1962.
Tuition $2,020.00 (two years). Instruments and books approximately $231.00.

No. 120.21 & 121.21 Four academic years, half time. September 19, 1960, to May 1964. (Two and one half days weekly.)
Tuition $2,020.00 (four years). Instruments and books approximately $231.00.

These courses are designed for comprehensive preparation in Periodontia and Oral Medicine and are of particular significance for certification towards specialization. All didactic and clinical phases are covered with the objective of developing expert proficiency.

No. 222. GRADUATE COURSE IN PERIODONTIA AND ORAL MEDICINE

Two academic years, full or half time, beginning Sept. 19, 1960. Tuition $2,020.00. (two years). Instruments and books approximately $275.00.

This program leads to the degree of Master of Science (in Dentistry). The objectives are to teach superior proficiency in Periodontia and Oral Medicine based on adequate background in the basic sciences.

For further information, write to the Secretary, Postgraduate Studies, New York University College of Dentistry, 421 First Ave., New York, N. Y.

NEW YORK UNIVERSITY COLLEGE OF DENTISTRY

COURSE ON ULTRASONICS FOR THE GENERAL PRACTITIONER

The Department of Periodontia and Oral Medicine of the New York University College of Dentistry announces a one-day basic course in *The Uses of Ultrasonics in Periodontal Therapy* on Friday, April 14, 1961, from 9:30 a.m. to 5:30 p.m.

The purpose of the course is to acquaint the general practitioner with the scientific principles and clinical uses of ultrasonic vibrations in periodontal therapy.

The curriculum will consist of lectures, a review of research to date in the field, closed circuit television demonstrations and participation by the students in the use of a prophylactic unit. The fee, $35 per registrant, will provide each attending member with a manual of the course as well as luncheon. The course will be directed by Dr. Sidney Sorrin, assisted by Drs. N. Alderman, A. Arvins, S. J. Ewen, M. J. Pomeranz, M. Simring, and S. S. Stahl. Applications for the course may be obtained by writing to Director, Postgraduate Division; New York University College of Dentistry; 421 First Avenue; New York 10, New York.

ALBERT EINSTEIN COLLEGE OF MEDICINE OF YESHIVA UNIVERSITY DEPARTMENT OF DENTISTRY

The Department of Dentistry of the Albert Einstein College of Medicine of Yeshiva University announces the following postgraduate courses:

Anesthesiology DPD 11—Pre-medication, Co-medication and Supportive Therapy in Dental Practice. Dr. Stanley R. Spiro and Associates. April 6 and 7, 1961. $60.00.

Anesthesiology DPD 19—Pre-operative and Pre-Anesthetic Evaluation Techniques for all Dental Patients. Dr. Stanley R. Spiro and Associates. June 9, 1961. $30.00.

Dento-Alevolar Surgery DPD 33—Drs. Herbert Calman, Stanley J. Behrman, William Rakower and Associates. May 4 and 5, 1961. $50.00.

Periodontics DPD 69—Drs. Irving Yudkoff, Marvin N. Okun and Associates. Oct. 30 and 31. Nov. 1, 2 and 3, 1961. $175.00.

For further information and application blanks write to Director, Postgraduate Dental Program, Albert Einstein College of Medicine, Yeshiva University, Eastchester Road and Morris Park Avenue, Bronx 61, New York.

UNIVERSITY OF PENNSYLVANIA SCHOOL OF DENTISTRY

Applications are being accepted for a Clinical Fellow in Oral Pathology supported by the American Cancer Society, tenable at the Department of Pathology, School of Dentistry, University of Pennsylvania, for a period of one year beginning July 1, 1961. This fellowship is open to U.S. citizens who are graduates of a U.S. Dental School. A stipend of $3600 (tax free) accompanies the fellowship. The program is planned to suit the specific needs and interests of the Fellow. Each candidate should submit a curriculum vitae and letters of reference. Reply to: Dr. C. E. Wilde, Jr., Department of Pathology, School of Dentistry, University of Pennsylvania, 4001 Spruce Street, Philadelphia 4, Pennsylvania.

UNIVERSITY OF PENNSYLVANIA SCHOOL OF DENTISTRY

Research and Teaching Traineeships

Research and Teaching Traineeships in the basic sciences, in periodontology and in the comprehensive treatment and rehabilitation of the cleft palate patient are available at the School of Dentistry, University of Pennsylvania.

Candidates for the traineeships in the basic sciences must qualify for admission to the Graduate School of Arts and Sciences. These traineeships may lead to M.S. or Ph.D. degrees.

The traineeship in periodontology is a 2 year program devoted to basic science studies, clinical practice and research. It is intended primarily for those individuals who wish to enter into teaching and research in periodonotology.

The traineeship in the comprehensive treatment and rehabilitation of the cleft palate patient is clinically oriented; however, opportunities for coursework in fields related to cleft palate therapy are available.

All traineeships are supported by the U.S. Public Health Service. Annual stipends vary from $4,500 and up depending on the qualifications and needs of the successful candidates. Inquiries for the basic science and cleft palate traineeships should be sent to the Chairman, Committee on Traineeships and Fellowships, University of Pennsylvania, School of Dentistry, 4001 Spruce Street, Philadelphia 4, Pennsylvania. Inquiries for the traineeships in periodontology should be sent to: Dean, Graduate School of Medicine, 237 Medical Laboratories, University of Pennsylvania, Philadelphia 4, Pennsylvania.

THE AMERICAN ACADEMY OF ORAL PATHOLOGY

The American Academy of Oral Pathology will hold its 15th annual meeting at the School of Dentistry, University of Michigan, Ann Arbor, on 6-8 April 1961. Examination for elevation to Fellowship will be held on 6 April at 9:00 a.m. in the Pathology Building. The Scientific Session will be held on 7 April in the Basic Science Building. The Third Annual Helen McLain Lecture, "Rudolph Virchow—Statesman, Anthropologist, and Father of Cellular Pathology," will be given by Dr. Harold A. Oberman, University of Michigan. The Annual Symposium will be held on 8 April.

Interested guests should please contact: Dr. Robert J. Gorlin, Professor and Chairman, Oral Pathology, School of Dentistry, University of Minnesota, Minneapolis 14, Minn.

UNIVERSITY OF ALABAMA SCHOOL OF DENTISTRY

The following refresher courses will be offered at the University of Alabama School of Dentistry during the month of May, 1961:

May 6 and 7, 1961: Pedodontics for the General Practitioner. Clinician: Dr. Sidney B. Finn.

May 10, 11, 12, 1961: Immediate Root Canal Therapy followed by Apicoectomy. Clinician: Dr. Adeeb E. Thomas.

May 22, 23, 24, 1961: Surgical Anatomy of the Head and Neck. Clinician: Dr. Harry Sicher.

Further information may be obtained from: The Director, Refresher Course Program, University of Alabama School of Dentistry, 1919 Seventh Avenue South, Birmingham, Alabama.

TUFTS UNIVERSITY SCHOOL OF DENTAL MEDICINE

Major General Joseph L. Bernier, Assistant Surgeon General and Chief of the Dental Corps., USA will be one of the principal speakers at the Tufts 12th Annual Berkshire Conference in Periodontology and Oral Pathology. General Bernier will present a clinico-pathological seminar on the subect, "Developments in the Understanding of Malignancy as They Relate to the Diagnosis and Treatment of Oral Lesions."

The Berkshire Conference, now in its 12th year, will be conducted at Eastover in Lenox, Massachusetts, June 18-22, 1961. The overall theme of the conference this year is "The Current Clinical Significance of Developments of the Past Twelve Years." Other Lecturers on the Conference will be: Finn Brudevold, Irving Glickman, Reidar F. Sognnaes, John B. MacDonald, Sigurd Ramfjord, Everett Shapiro, David Weisberger, Frank M. Wentz.

The conference is open to general practitioners and dentists in specialized practice. Information regarding participation may be obtained by writing:

Tufts Berkshire Conference, Tufts University School of Dental Medicine, 136 Harrison Avenue, Boston 11, Massachusetts.

NEW YORK UNIVERSITY COLLEGE OF DENTISTRY

Workshop in Practice Management, Doctor-Patient Relations, Motivation of Patients

by J. Lewis Blass and Associates. Full Week of June 19-23, 1961. Apply to: Postgraduate Secretary, 421 First Avenue, New York 10, N. Y.

WEST VIRGINIA UNIVERSITY SCHOOL OF DENTISTRY

The West Virginia University School of Dentistry is introducing its first series of postgraduate refresher courses this year. A listing of the courses to be presented follows:

P.G. 11. Practical Periodontics for the General Practitioner, C. M. Fraleigh, April 7-8.

P.G. 1. Refresher Course in Crown and Bridge Prosthodontics, J. F. Johnston and J. D. Adams, April 10-11.

P.G. 5. High Speed Instrumentation, R. E. Sausen and W. F. Braasch, April 14-15.

P.G. 12. Complete Denture Impressions and Jaw Relationship Records, J. B. Davis and J. C. Eselman, April 17, 18, 19.

P.G. 2. Refresher Course in Principles and Technics of Crowns and Bridges, J. D. Adams, one day a week, April 27, May 4, 11, 18, 25.

P.G. 8. Cephalometry, V. Sassouni and W. M. Krogman, May 22, 23, 24.

P.G. 6. Inlay Restorations, R. E. Sausen, one day a week, June 16, 23, 30.

For further information please contact The Office of the Dean, West Virginia University School of Dentistry, Morgantown, West Virginia.

THE ACADEMY OF GENERAL DENTISTRY TO TAKE COURSE AT MICHAEL REESE HOSPITAL AND MEDICAL CENTER

On Wednesday, May 10th, the Dental Department of Michael Reese Hospital and Medical Center will present a full day course on "The Hospital—An Adjunct to Dental Practice" expressly for members of The Academy of General Dentistry.

The course is directed toward making available to the general practitioner, hospital dental service experiences in medico-dental evaluations and correlated medico-dental treatment. It will add still another dimension toward fulfilling that complete health service for which the dentist continually strives for his patients.

The faculty for the course includes Dr. Gerard Casey, Secretary, Council on Hospital Dental Service, American Dental Association and the following members of the Michael Reese Hospital and Medical Center, Department of Dentistry: Dr. Saul Levy, Director and Chairman; Dr. Arthur Elfenbaum, Head of Diagnostic Section and Dr. Howard Adilman of the Oral Surgery Section.

For full details and the complete program, write to Dental Department, Michael Reese Hospital and Medical Center, 29th and Ellis Avenue, Chicago 16, Illinois or Dr. J. J. Applebaum, President of the Chicago Chapter Academy for General Dentists, 4000 W. Lawrence Avenue, Chicago, Illinois.

ALPHA OMEGA FRATERNITY

Alpha Omega Fraternity is sponsoring an all day seminar at the *Town House Motel and Restaurant* on Friday, May 5th, 1961, from 9:15 to 4:30. Breakfast coffee, luncheon, and coffee break will be served. The *Town House Motel and Restaurant* is reached by N. Y. Thruway at Yonkers *Exit 6W*. 13 minutes from the Triboro Bridge. There is free parking.

The program will consist of 4 all day clinics and a luncheon speaker.

D. Walter Cohen will clinic on "Periodontal Research."

Lionel Gold will clinic on "Oral Surgery and White Patches."

Jerome Sklaroff will clinic on "Orthodontia."

Leonard Abrams will clinic on "Rehabilitation."

Sidney Sorrin, the Luncheon Speaker, will discuss, "The Present Status of Periodontal Treatment."

The fee is $25, Tax deductible and the proceeds will go to the Israel Dental School and the Under-

graduate Fund.
Further information may be obtained from William Greenhut, D.D.S., 124 East 84th Street, New York, N. Y.

FEDERATION DENTAIRE INTERNATIONALE

The first annual meeting of the Federation Dentaire Internationale held in conjunction with the annual session of the American Dental Association was held in Los Angeles on Monday, October 17. The size of the meeting and the enthusiasm displayed relative to F.D.I. possibilities indicated a continually increasing group with the knowledge of the possibilities of the F.D.I.

Practically all organizations of every type have representation today at the international level. The F.D.I. during the past several years has been working with the World Health Organization (W.H.O.) and consequently dental Health programs are parallelling the W.H.O. health programs throughout the world.

Medicine has the two representatives at the international level, The World Health Organization and the World Medical Society. The dental profession has only the one international contact and that is through the Federation Dentaire Internationale. Certainly the prestige and the serviceability of dentistry dictates the positive necessity of having dentistry represented at the international level.

The 1961 annual meeting of the Federation will be held at Helsinki, Finland, July 9 to 16. The present interest manifest in the meeting indicates that there will be a large number of USA dentists who will attend the meeting. All those interested may contact Dr. Obed H. Moen, 6 Main Street, Watertown, Wisconsin, USA, National Treasurer for the FDI.

Application for Membership
FEDERATION DENTAIRE INTERNATIONALE

I wish to become a Supporting Member of the Federation Dentaire Internationale and subscribe to the International Dental Journal.

Name .....
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Degrees .....

Address .....
(PLEASE PRINT)

I am a Member of the American Dental Association.

I enclose $15.00 for Supporting Membership and subscription to the International Dental Journal for the year .....

PLEASE COMPLETE AND RETURN WITH YOUR REMITTANCE TO
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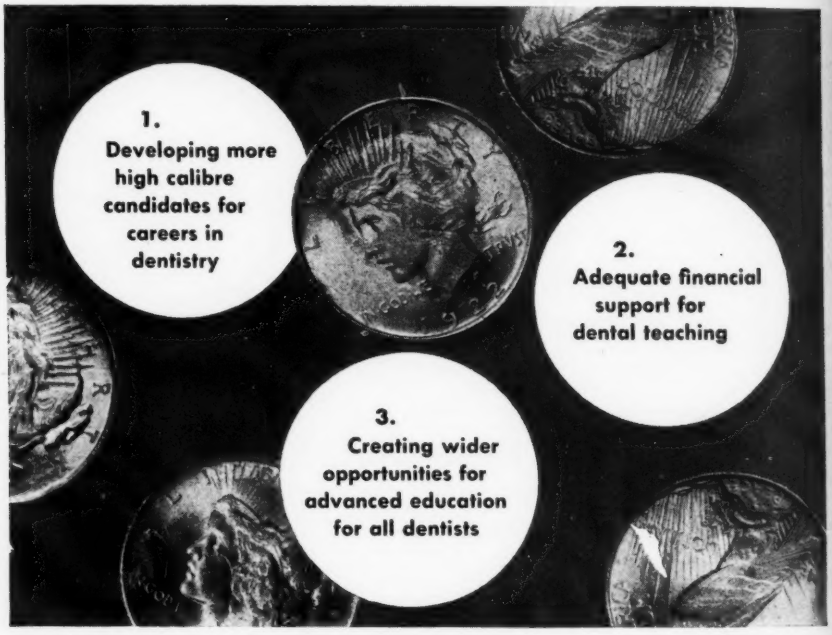
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